Q2 3

ORDER NO. HAD84092911C2

Service Manual

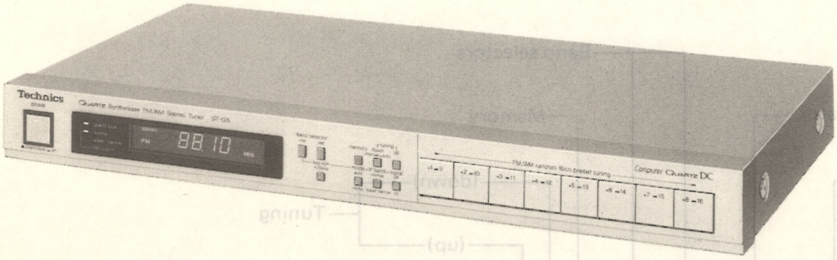
Tuner

QUARTZ Synthesizer FM/AM Stereo Tuner

ST-G5

Color
(K)...Black Type
(S)...Silver Type

Color	Area
(K) (S)	[EGA]...F.R. Germany



TECHNISCHE DATEN

(DIN 45 500)

■ UKW-TUNERTEIL

Wellenbereich	87,50 ~ 108,00 MHz 87,525 ~ 108,00 MHz (+25 kHz shift)
Eingangsempfindlichkeit	
S/R 30 dB	1,3 μV (75 Ω)
S/R 26 dB	1,2 μV (75 Ω)
S/R 20 dB	0,9 μV (75 Ω)
Nutzempfindlichkeit nach IHF	1,5 μV (nach IHF '58)
Stereoumschaltschwelle bei 46 dB nach IHF	28 μV/75 Ω
Gesamtklirrfaktor	
Mono	0,03%
Stereo	0,04%
Geräuschabstand	
Mono	70 dB (78 dB nach IHF)
Stereo	65 dB (70 dB nach IHF)
Frequenzgang	5 Hz ~ 18 kHz (+0,2 dB ~ −0,5 dB)
Trennschärfe bei Störsender	
normal ±400 kHz	55 dB
super narrow ±200 kHz	25 dB
Einfangverhältnis	1,0 dB
Spiegelfrequenz-Dämpfung bei 98 MHz	75 dB
ZF-Dämpfung bei 98 MHz	100 dB
Ansprechdämpfung auf Nebenfrequenzen bei 98 MHz	100 dB
MW-Unterdrückung	55 dB
Übersprechdämpfung	
1 kHz	60 dB
Trägerrest	
19 kHz	−65 dB (−70 dB nach IHF)
38 kHz	−48 dB (−50 dB nach IHF)

Kanalabweichung (250 Hz ~ 6300 Hz)	±1,0 dB
Begrenzereinsatz	0,75 μV
Bandbreite	
ZF-Verstärker	180 kHz
UKW-Demodulator	1000 kHz
Antennenanschluß	75 Ω (unsymmetrisch)

■ MW-TUNERTEIL

Wellenbereiche	522 kHz~1611 kHz (9 kHz) 530 kHz~1620 kHz (10 kHz)
Eingangsempfindlichkeit (S/R 20 dB)	20 μV, 290 μV/m
Trennschärfe (±9 kHz)	55 dB
Spiegelfrequenz-Dämpfung bei 999 kHz	40 dB
ZF-Dämpfung bei 999 kHz	60 dB

■ ALLGEMEINE DATEN

Ausgangsspannung	1,0 V
Leistungsaufnahme	9W
Netzspannung	Wechselstrom 50 Hz/60 Hz, 220V
Abmessungen (B×H×T)	430 × 53 × 245 mm
Gewicht	2,4 kg

Bemerkung:
Der Gesamtklirrfaktor wurde mit einem digitalen Rauschspektrometer (Anlage H.P. 3045) gemessen.

(Die technischen Daten können infolge von Verbesserungen ohne Ankündigung geändert werden.)

Technics

Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan

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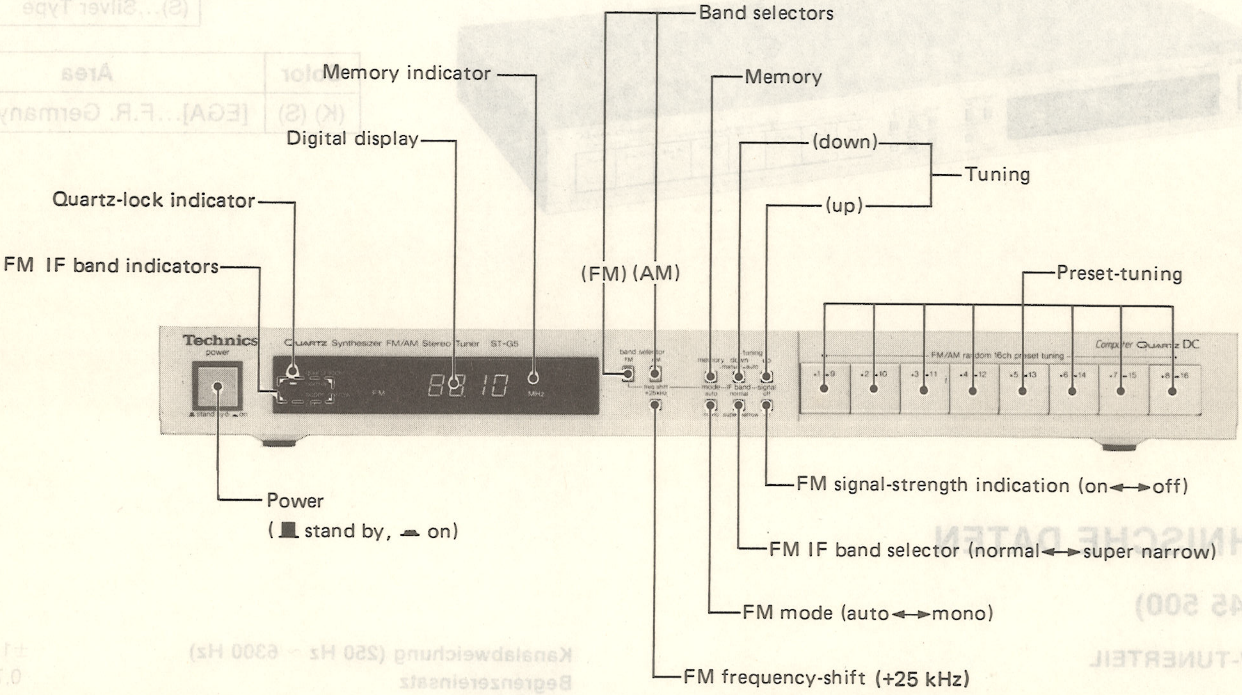
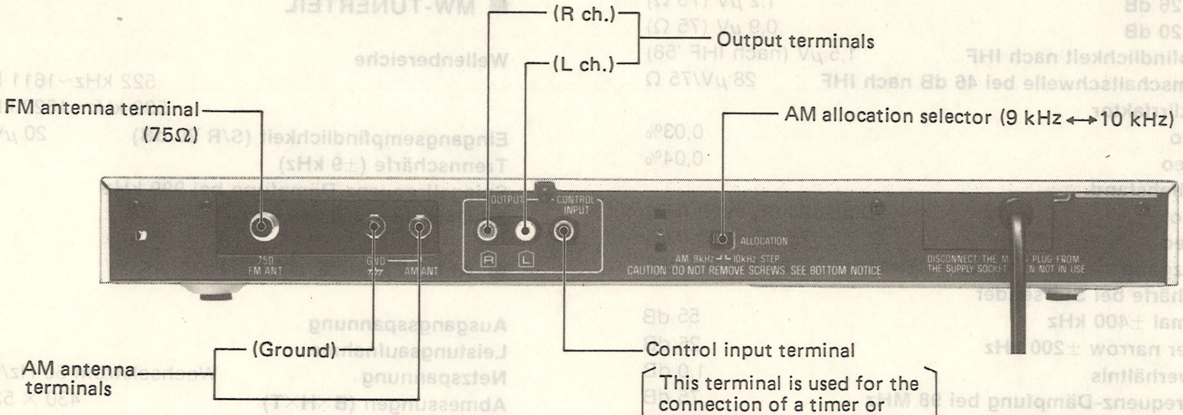
LOCATION OF CONTROLS



Band selectors
Memory indicator
Memory
Digital display
(down)
Tuning
(up)
Quartz-lock indicator
FM IF band indicators
(FM) (AM)
Preset-tuning
Technics
Quartz Synthesizer FM/AM Stereo Tuner ST-G5
88.10 MHz
Computer Quartz DC
FM signal-strength indication (on◀▶off)
Power
(▆ stand by, ▂ on)
FM IF band selector (normal◀▶super narrow)
FM mode (auto◀▶mono)
FM frequency-shift (+25 kHz)



(R ch.)
(L ch.)
Output terminals
FM antenna terminal (75Ω)
AM allocation selector (9 kHz◀▶10 kHz)
75Ω FM ANT
GND
AM ANT
OUTPUT
CONTROL INPUT
R
L
AM 9kHz ↔ 10kHz STEP
ALLOCATION
CAUTION: DO NOT REMOVE SCREWS. SEE BOTTOM NOTICE
DISCONNECT THE MAINS PLUG FROM THE SUPPLY SOCKET WHEN NOT IN USE
(Ground)
AM antenna terminals
Control input terminal

This terminal is used for the connection of a timer or remote-control unit for the purpose of controlling the tuner by means of an external control signal.

■ CONTENTS

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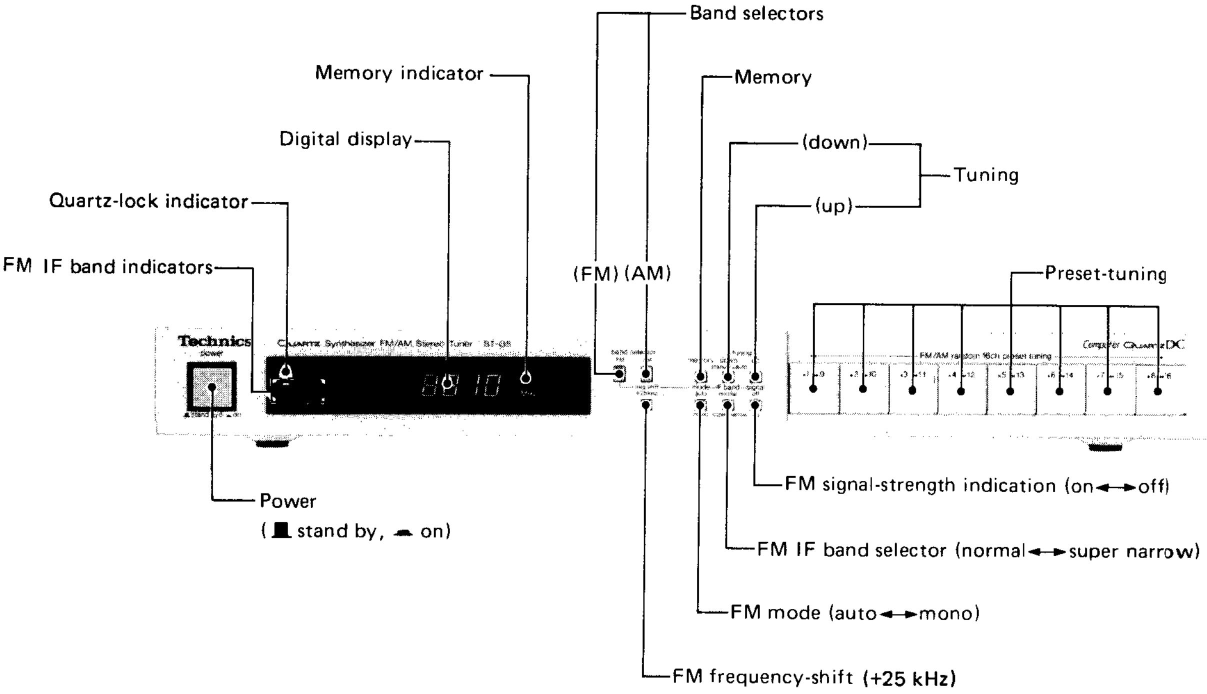
■ LOCATION OF CONTROLS



Band selectors
Memory indicator
Memory
Digital display
(down)
Tuning
(up)
Quartz-lock indicator
FM IF band indicators
(FM) (AM)
Preset-tuning
Technics
Power
(▀ stand by, ▃ on)
FM signal-strength indication (on◄—►off)
FM IF band selector (normal◄—►super narrow)
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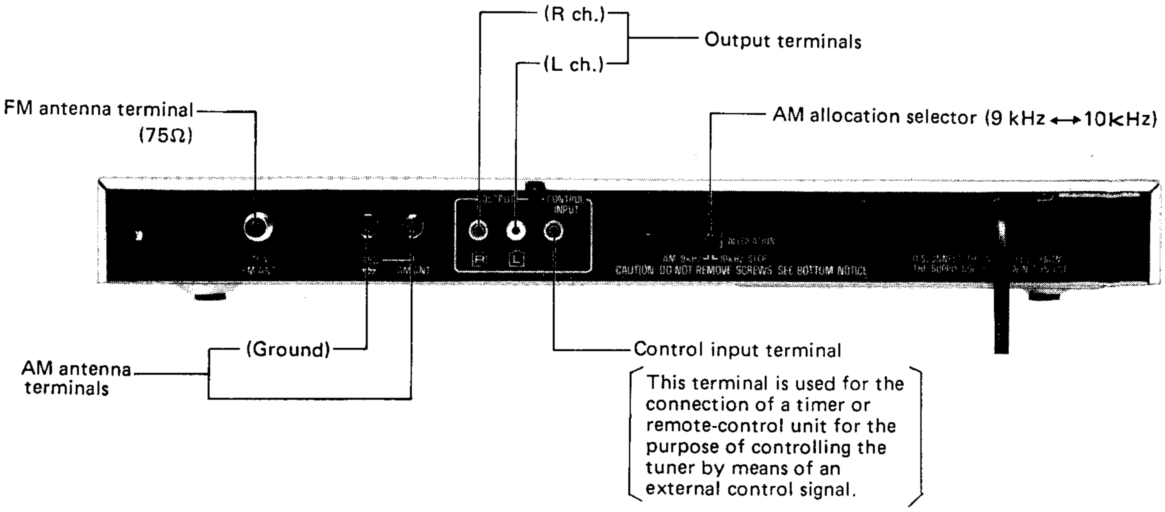
FM frequency-shift (+25 kHz)



(R ch.)
Output terminals
(L ch.)
FM antenna terminal (75Ω)
AM allocation selector (9 kHz◄—►10kHz)
(Ground)
AM antenna terminals
Control input terminal

This terminal is used for the connection of a timer or remote-control unit for the purpose of controlling the tuner by means of an external control signal.

■ HOW TO PRESET RADIO BROADCAST FREQUENCIES

This unit can be used to preset as many as 16 radio broadcast frequencies: FM/AM random presetting. After broadcast frequencies have been preset as described below, any desired station can be quickly and easily selected by simply touching one button.

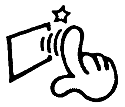
• Memory presetting

There are two types of memory presetting: automatic and manual. Select whichever is preferred.

• Before memory presetting

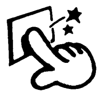
Each button is used to preset two stations.

Presetting front channels (CH 1~8)



Press momentarily.

Presetting back channels (CH 9~16)



Press slightly longer.

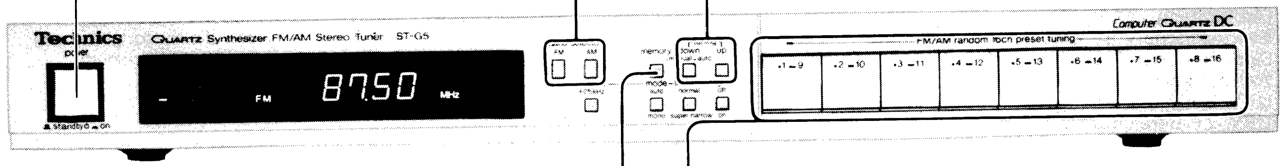
Automatic memory presetting

Beginning at the frequency indicated by the digital display, the FM broadcasting stations and AM broadcasting stations will be automatically preset to "channels" 1 through 8 for FM and 9 through 16 for AM, respectively. Note that in mountainous or remote areas, broadcasting stations which have weak broadcasting signals cannot be automatically preset into the memory.

❶ **Power: "on" (■→▬)**

❷ **Press the "FM" or "AM" button.**

❸ **Set to the minimum frequency.**
• FM: 87.50 MHz
• AM: 522 kHz or 530 kHz


Technics
power
Quartz Synthesizer FM/AM Stereo Tuner ST-G5
FM
87.50
MHz
FM/AM random 16ch preset tuning
1—9
2—10
3—11
4—12
5—13
6—14
7—15
8—16
Computer Quartz DC

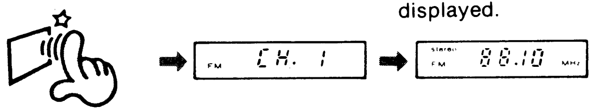
❹ **Press. When the frequency indication begins to change, release.**

(The frequency will change upward, and the automatic presetting will begin with the lowest broadcasting station of the lowest frequency and will continue in order.)

❺ Confirm the names (call signs, etc.) of the broadcasting stations which are preset to each channel, and enter them on the file sheet.

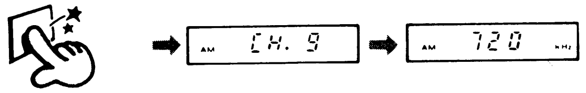
To check the front channels (CH1~8):

Press momentarily. → Channel number is displayed. → Frequency stored in the memory is displayed.



To check the back channels (CH 9~16):

Press slightly longer. → Release the button when the channel number is displayed. → Frequency stored in the memory is displayed.



Manual memory presetting

Stations can be freely preset to any desired channel.

❶ **Power: "on" (■→▬)**

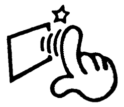
❷ **Press the "FM" or "AM" button.**

❸ **Press the appropriate tuning button to tune to the desired broadcast.**

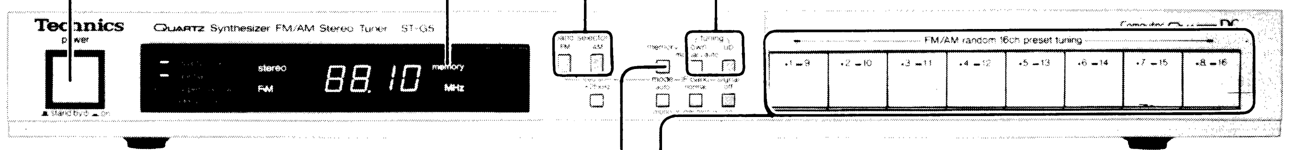
- **Auto tuning**
  Press the button. When the frequency indication begins to change, release the button (a broadcasting station will be selected automatically). Repeat this operation until the desired station is found.

⬇

- **Manual tuning**
  Press the button momentarily (the frequency will change each time the button is pressed) and tune to the desired station.



Memory indicator

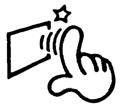

Technics
power
Quartz Synthesizer FM/AM Stereo Tuner ST-G5
stereo
FM
88.10
memory
MHz
FM/AM random 16ch preset tuning
1—9
2—10
3—11
4—12
5—13
6—14
7—15
8—16

❹ **Press momentarily, and then release.**
(The memory indicator will illuminate for approximately 4 seconds.)

Note:
If the button is pressed continuously, the frequency will begin to change, and the memory will be preset automatically.
In order to stop the automatic selection, press either the "up" button or the "down" button.

❺ **While the memory indicator is illuminated, press the button of the desired channel.**

- **To preset channels 1 through 8:**



Press the button momentarily, and then release.

- **To preset channels 9 through 16:**

Press the button slightly longer, and then release.

When the button is pressed, the memory indicator illumination will stop, and the presetting is complete.

Note:
1. If the memory indication illumination stops before you press the button, once again repeat step (4) and then step (5).
2. If a new broadcasting station is preset into a channel, the broadcasting station which was previously entered in that channel will be automatically erased.

❻ **Enter the name (call sign, etc.) of the preset broadcasting station on the file sheet.**
This completes the procedures for presetting radio broadcast frequencies. The other preset-tuning buttons can be preset in the same way by following steps (2) through (5).

■ BEFORE REPAIR

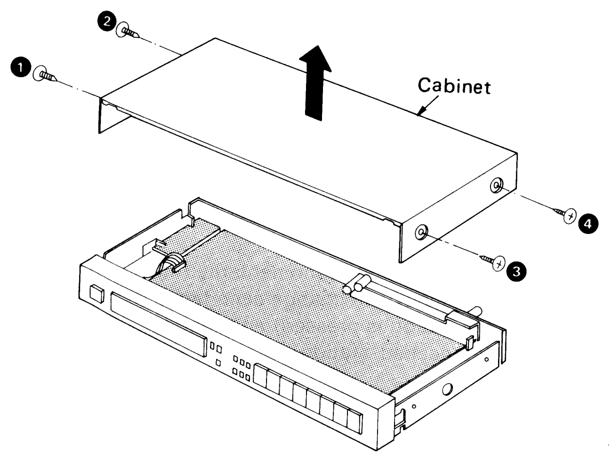
The power switch of this unit is located on the secondary side of the power transformer. Be sure to disconnect the power cord from the socket before servicing. Also, do the following before repair of digital circuits.
(1) Disconnect the power cord from the socket.
(2) Using a 10Ω, 1W resistor, short circuit electrolytic "gold" capacitors C904 and C905 momentarily to discharge them.

■ DISASSEMBLY INSTRUCTIONS

Ref. No. 1 — **How to remove the cabinet**

Procedure 1

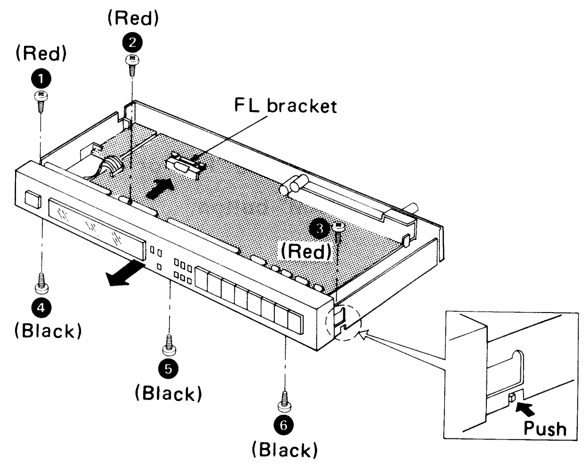
- Remove the 4 screws (❶ ~ ❹)



Ref. No. 2 — **How to remove the front panel**

Procedure 1 → 2

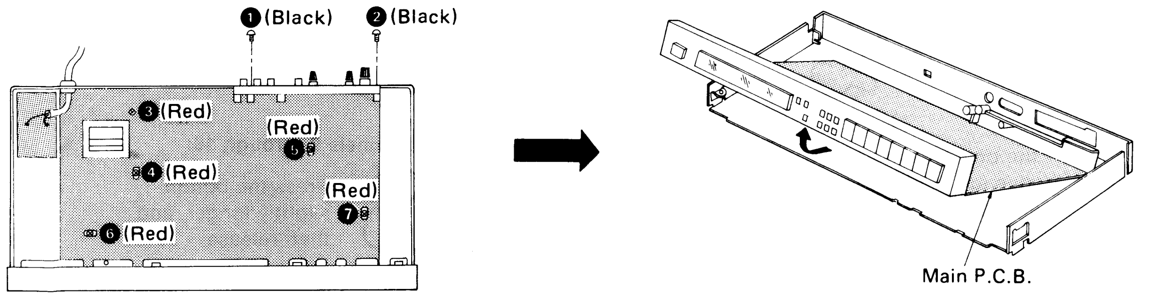
- Remove the 6 screws (❶ ~ ❻)



Ref. No. 3 — **How to remove the main P.C.B.**

Procedure 1 → 2 → 3

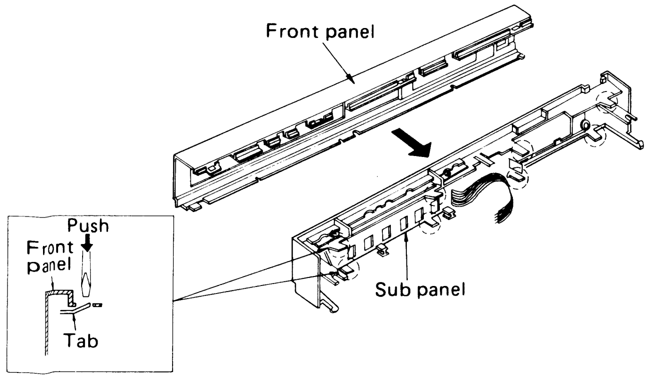
- Remove the 7 screws (❶ ~ ❼)
- Slightly pull the front panel toward you and remove the main P.C.B.



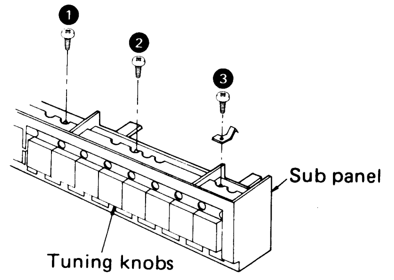
Ref. No. 4 — **How to remove the front sub-panel and tuning knobs**

Procedure 1 → 2 → 4

- Push the 8 tabs aside



- Remove the 3 screws (❶ ~ ❸)



■ MESSUNGEN UND JUSTIERUNGEN

Anmerkung: AM-OSC-Spule (L203) und "Antibirdy"- Filter (L303) sind bereits justiert und benötigen daher keine Justierung.

AM (MW)-EINSTELLUNG

* **Stellungen und zu benutzende Geräte**

1. Elektronische Voltmeter für Wechsel- und Gleichstrom (EVM).
2. AM (MW)-Meßsender (MW-MS).
3. Wellenbereich-Wahlschalter
4. Netzspannung auf ihren Sollwert halten.
5. Der Ausgang des Meßsenders sollte nicht höher sein als unbedingt notwendig für eine gute Ablesung.
6. Einen nichtmetallischen Schraubenzieher für die Einstellungen verwenden.

Nr.	AM (MW)-MESSENDER		ANZEIGE-FREQUENZ DURCH VOR-EINSTELLUNG	VORBEREITUNG	ABGLEICHS-PUNKTE	ABGLEICHSVERFAHREN
	ANSCHLUSS	FREQUENZ				
	AM (MW)-ZF-ABGLEICH					
1	MW-MS über 200 pF-Kondensator an den AM-Antennenanschluß anschließen. Erdung an Chassis. (Starker Eingang.) (Siehe Abb. 1)	450 kHz (400 Hz Modulat., 30%)	Kein Empfang	Wechselstrom-Voltmeter oder Oszillograph an die Ausg "OUTPUT"-Anschlüsse schließen.	T201 (1. IFT) T202 (2. IFT)	Die Eingangsfrequenz und die Einstellungspunkte so justieren, daß der Ausgang maximal wird.
	AM (MW)-HF-ABGLEICH					
2	MW-MS über 200 pF-Kondensator an den AM-Antennenanschluß anschließen. (Schwacher Eingang.) (Siehe Abb. 1.)	612 kHz (400 Hz Modulat., 30%)	612 kHz	Wechselstrom-Voltmeter an die "OUTPUT"-Anschlüsse anschließen.	L202 (Ant. Spule)	1. Auf max. Ausgang abgleichen. 2. Den Kern von L202 mit einem Schraubendreher justieren.
3		1503 kHz (400 Hz Modulat., 30%)	1503 kHz		CT201 (Ant. Trimmer)	1. Auf max. Ausgang abgleichen. 2. Die Schritte (2) und (3) wiederholen, bis die Frequenz genau mit der Skalenanzeige übereinstimmt.

FM (UKW)-EINSTELLUNG

* **Stellungen und zu benutzende Geräte**

1. UKW-Meßsender ((UKW-MS)
2. Klirrfaktor-Meßbrücke.
3. Oszillograph.
4. Elektronische Voltmeter für Gleichstrom (EVM).
5. Signalfrequenzmesser (meßbar für 19 kHz und 108 MHz).
6. Wellenbereich-Wahlschalter. . . . . FM
7. UKW-Betriebsartenschalter. . . . . mono
8. UKW-ZF-Bereichwahlschalter. . . . . normal

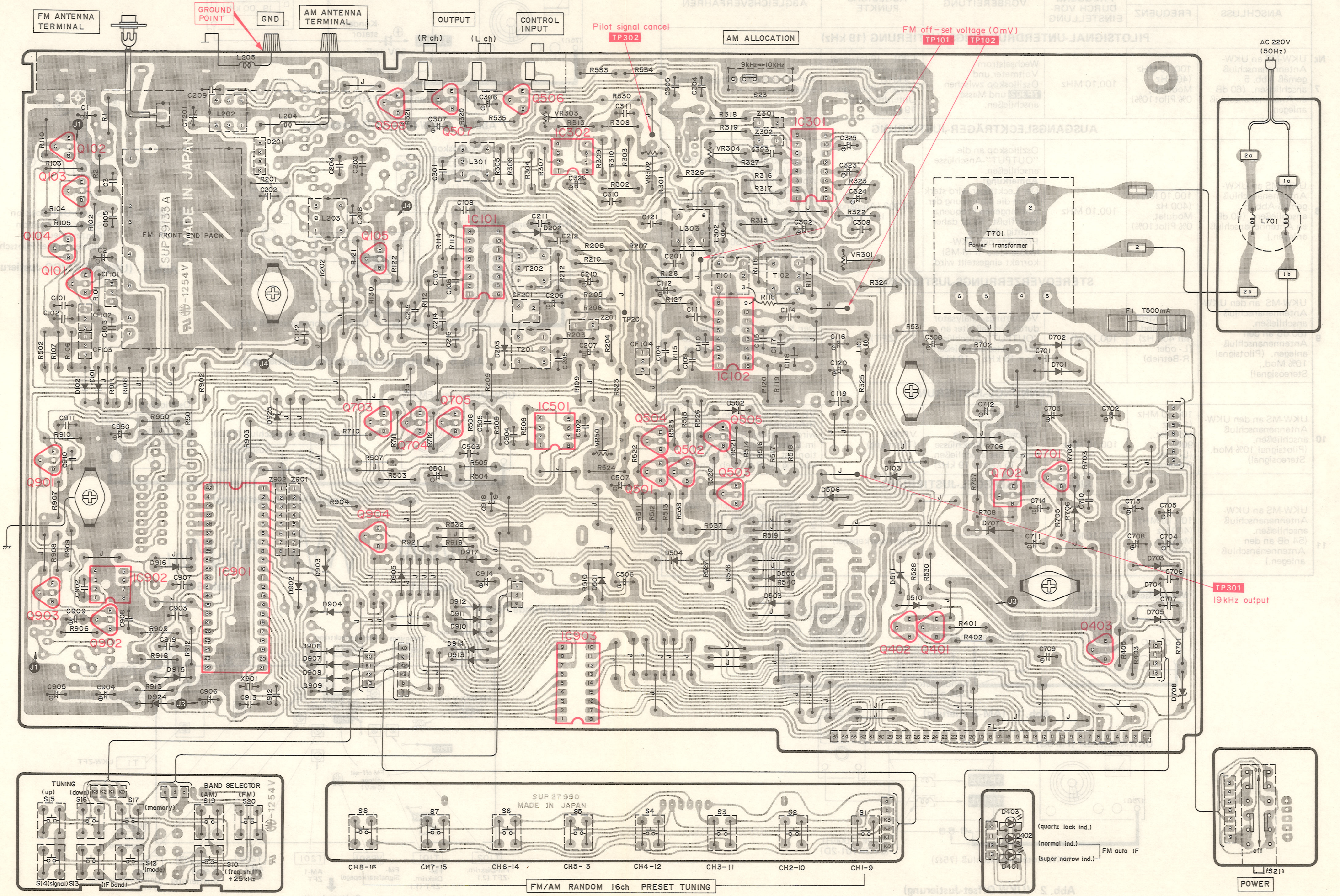
* **Vorbereitung des UKW-Meßoszillators (UKW-MO)**

Die Normal-Eingangsleistung dieses Gerätes beträgt 60 dB (1 mV), 400 Hz, 100% Modulation. (Wegen der Dämpfung bei Verwendung von Koaxialkabeln, muß die MO-Ausgangsleistung 6 dB oder mehr betragen: d.h. wenn die Eingangsleistung 60 dB beträgt, muß der MO-Ausgang 66 dB betragen.

Nr.	FM (UKW)-MESSENDER		ANZEIGE-FREQUENZ DURCH VOR-EINSTELLUNG	VORBEREITUNG	ABGLEICHS-PUNKTE	ABGLEICHSVERFAHREN
	ANSCHLUSS	FREQUENZ				
	ABGLEICH AUF MIN. VERZERRUNG IN STELLUNG UKW-MONO					
4	UKW-MS an FM Antennende anschließen, wie in Abb. 2 gezeigt. (60 dB an den Antenneneingang anlegen.)	100.10 MHz (400 Hz Modulat., 100%)	100.10 MHz	Ein Gleichstrom-Voltmeter zwischen **TP101** und **TP102** über eine Drosselspule verbinden. (Siehe Abb. 2)	T101 (Diskriminator ZFT)	1. Den Kern von T101 so justieren, daß die gemessene Spannung im signallosen Modus 0 mV im 300 mV-Bereich beträgt.
5		100.10 MHz (400 Hz Modulat., 100%)	100.10 MHz	Klirrfaktor-Meßbrücke an "OUTPUT" Anschlüsse anschließen.	T102 (Diskriminator ZFT)	Den Kern von für minimale Verzerrung des rechten und linken Kanals justieren.

Nr.	UKW-STEREO-DEKODER-ABGLEICH	
	BEI VERWENDUNG EINES ZÄHLERS	BEI VERWENDUNG EINER ALTERNATIV-MESS METHODE
6	1. Unmoduliertes Mono-Signal 100 MHz in das Gerät speisen. 2. UKW-Betriebsart-Wahlschalter auf "auto" stellen. 3. Frequenzmesser über einen Kondensator (50V, 1μF) an **TP301** anschließen. (Siehe Abb. 3.) 4. **VR301** auf 19 kHz ± 30 Hz einstellen.	1. Stereosignal entweder vom Meßsender, oder einem Stereosender einspeisen. 2. **VR301** so einstellen, daß die Stereolampe aufleuchtet Schleifer von **VR301** mit Lack sichern, wie in Abb. 4 gezeigt.

■ CIRCUIT BOARD AND WIRING CONNECTION DIAGRAM


FM ANTENNA TERMINAL
GROUND POINT
GND
AM ANTENNA TERMINAL
OUTPUT
(R ch)
(L ch)
CONTROL INPUT
Pilot signal cancel
TP302
AM ALLOCATION
FM off-set voltage (0mV)
TP101
TP102
AC 220V (50Hz)
9kHz↔10kHz
FM FRONT END PACK
SUP 9133 A
MADE IN JAPAN
1254V
T701
Power transformer
L701
F1 T500mA
TP301
19kHz output
IC101
IC102
IC301
IC302
IC501
IC901
IC902
IC903
Q101
Q102
Q103
Q104
Q105
Q401
Q402
Q403
Q501
Q502
Q503
Q504
Q505
Q506
Q507
Q508
Q701
Q702
Q703
Q704
Q705
Q901
Q902
Q903
Q904
TUNING
(up)
(down)
BAND SELECTOR
(AM)
(FM)
(memory)
S12 (mode)
S10 (freq. shift) ±25 kHz
S14 (signal)
S13
(IF band)
SUP 27990
MADE IN JAPAN
CH8-16
CH7-15
CH6-14
CH5-13
CH4-12
CH3-11
CH2-10
CH1-9
FM/AM RANDOM 16ch PRESET TUNING
D403
D402
D401
(quartz lock ind.)
(normal ind.)
(super narrow ind.)
FM auto IF
(S21)
POWER

Nr.	FM (UKW)-MESSENDER ANSCHLUSS	FM (UKW)-MESSENDER FREQUENZ	ANZEIGE-FREQUENZ DURCH VOR-EINSTELLUNG	VORBEREITUNG	ABGLEICHS-PUNKTE	ABGLEICHSVERFAHREN
	PILOTSIGNAL-UNTERDRÜCKUNGS-JUSTIERUNG (19 kHz)					
7	UKW-MS an UKW-Antennenanschluß gemäß Abb. 5 anschließen. (60 dB an Antennenanschluß anlegen.)	100.10 MHz (400 Hz Modulat., 0% Pilot 10%)	100.10 MHz	Wechselstrom Voltmeter und Oszilloskop zwischen TP302 und Masse anschließen.	L301 (Pilotsignal-Unterdrückung 19 kHz) VR302 (Pilotsignal-Unterdrückung 19 kHz)	Auf minimale Ausgangsleistung abgleichen.
	AUSGANGSLECKTRÄGER-JUSTIERUNG					
8	UKW-MS an UKW-Antennenanschluß gemäß Abb. 6 anschließen. (60 dB an Antennenanschluß anlegen.)	100.10 MHz (400 Hz Modulat. 0% Pilot 10%)	100.10 MHz	Oszilloskop an die "OUTPUT"-Anschlüsse anschließen. **Anmerkung:** Der Leckträger wird stark durch die Ablenkung der empfangenen Frequenz beeinflußt. Es ist daher wichtig, daß die Frequenz des UKW-Meßsenders (FM-MS) korrekt eingestellt wird.	VR303 (Ausgangsleckträger)	VR303 so abgleichen, daß die Wellenform so ist, wie in Abb. 6-1 gezeigt. **Anmerkung:** Abb. 6-2 ist die durch schlechte Justierung von VR303 verursachte Wellenform. Abb. 6-3 ist die durch schlechte Justierung von L301 oder VR302 verursachte Wellenform.
	STEREOVERZERRUNGS-JUSTIERUNG					
9	UKW-MS an den UKW-Antennenanschluß anschließen. (60 dB an den Antennenanschluß anlegen. (Pilotsignal 10% Mod., Stereosignal)	100.10 MHz (100% Mod. mit 400 Hz) (L- oder R-Betrieb)	100.10 MHz	Verzerrungs-Analysator durch Tiefpaßfilter an "OUTPUT"-Anschlüsse des Gerätes anschließen. (fc = 15 kHz – 19 kHz)	T1 (ZFT)	Den Kern von T1 so abgleichen, daß die Verzerrung des rechten und linken Kanals minimal ist.
	TRENNUNGS-JUSTIERUNG					
10	UKW-MS an den UKW-Antennenanschluß anschließen. (Pilotsignal 10% Mod. Stereosignal)	100.10 MHz (1 kHz Modulat., 90%) (L- oder R-Betrieb)	100.10 MHz	Wechselstrom-Voltmeter durch Tiefpaßfilter an die "OUTPUT"-Anschlüsse des Gerätes anschließen. (fc = 15 kHz – 19 kHz)	VR304 (Trennung)	VR304 so abgleichen, daß die R-Ausgangsleistung minimal wird, wenn der Stereomodulator im L-Betrieb (L-Kanal-Modulation) ist, und daß die L-Ausgangsleistung bei R-Betrieb minimal ist.
	SIGNALSTÄRKEPEGEL-JUSTIERUNG					
11	UKW-MS an UKW-Antennenanschluß anschließen. (54 dB an den Antennenanschluß anlegen.)	100.10 MHz (400 Hz Modulat., 100%)	100.10 MHz	————————	VR501 (Signalstärkepegel)	1. VR501 so abgleichen, daß 54 dB angezeigt wird. 2. Überprüfen, daß der Signalstärkepegel 22 – 38 dB beträgt, wenn die Eingangsleistung 30 dB beträgt.

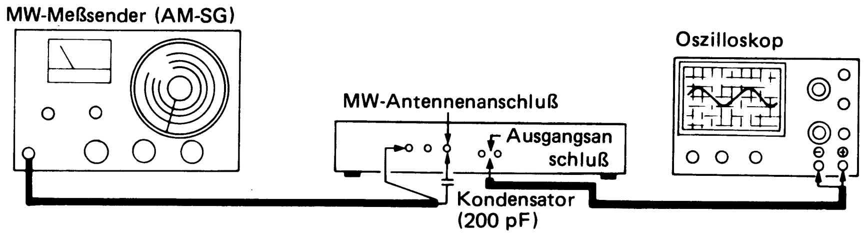

MW-Meßsender (AM-SG)
Oszilloskop
MW-Antennenanschluß
Ausgangsanschluß
Kondensator (200 pF)

Abb. 1 (AM-Justierung)

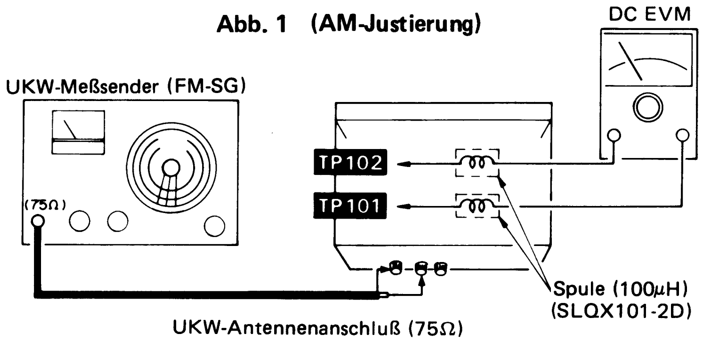

DC EVM
UKW-Meßsender (FM-SG)
(75Ω)
TP102
TP101
Spule (100μH) (SLQX101-2D)
UKW-Antennenanschluß (75Ω)

Abb. 2 (UKW-Offset-Justierung)

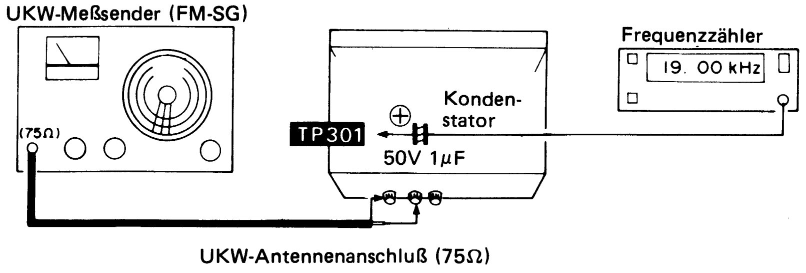
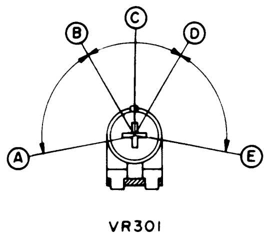

UKW-Meßsender (FM-SG)
Frequenzzähler
19. 00 kHz
Kondensator
(75Ω)
TP301
50V 1μF
UKW-Antennenanschluß (75Ω)

Abb. 3 (UKW-MPX-VCO-Justierung)



Ⓐ–Ⓑ, Ⓓ–Ⓔ : Stereo-OFF-Position
Ⓑ–Ⓓ : Stereo-ON-Position (Anzeige leuchtet)
Ⓒ : Justierung der Pilotschaltung

Abb. 4 (UKW-MPX-VCO-Justierung)

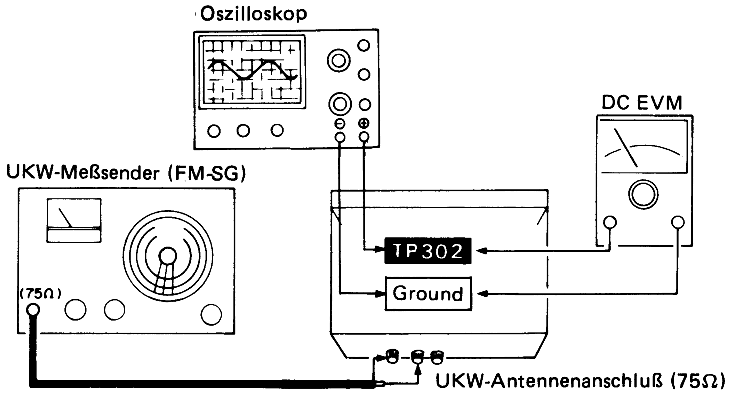

Oszilloskop
DC EVM
UKW-Meßsender (FM-SG)
(75Ω)
TP302
Ground
UKW-Antennenanschluß (75Ω)

Abb. 5 (Pilotsignal-Unterdrückung-Justierung)

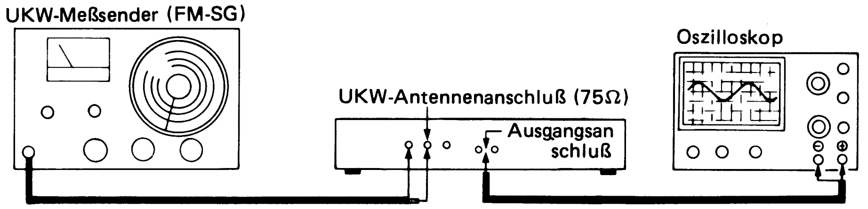

UKW-Meßsender (FM-SG)
Oszilloskop
UKW-Antennenanschluß (75Ω)
Ausgangsanschluß

Abb. 6 (Ausgangsleckträger-Justierung)

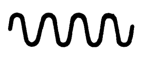


Abb. 6-1

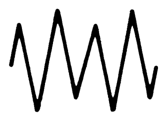


Abb. 6-2

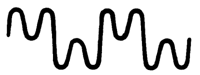
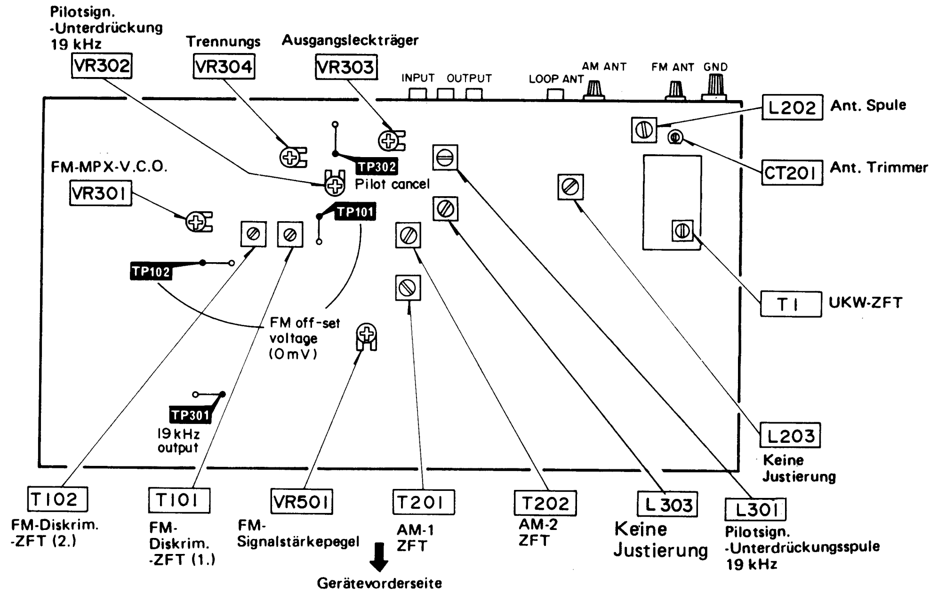
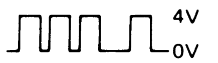
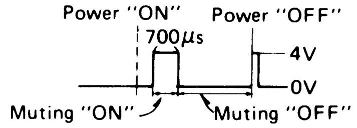
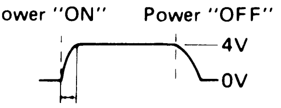
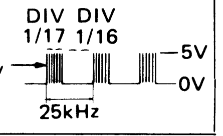
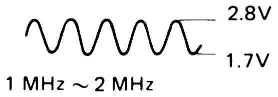


Abb. 6-3

- **ZUjustierende Punkte**


Pilotsign. -Unterdrückung 19 kHz
VR302
Trennungs
VR304
Ausgangsleckträger
VR303
INPUT
OUTPUT
LOOP ANT
AM ANT
FM ANT
GND
L202
Ant. Spule
CT201
Ant. Trimmer
FM-MPX-V.C.O.
VR301
TP302
Pilot cancel
TP101
TP102
FM off-set voltage (0mV)
TP301
19 kHz output
T1
UKW-ZFT
L203
Keine Justierung
T102
FM-Diskrim. -ZFT (2.)
T101
FM-Diskrim. -ZFT (1.)
VR501
FM-Signalstärkepegel
T201
AM-1 ZFT
T202
AM-2 ZFT
L303
Keine Justierung
L301
Pilotsign. -Unterdrückungsspule 19 kHz
Gerätevorderseite

■ FUNCTION OF TERMINAL (PLL CONTROLLER IC901)

Pin No.	Mark	Description of terminal
1	Sa	Segment signal output terminal for display. **(Refer to Fig. 7)**
2	Sb	
3	Sc	
4	Sd	
5	Se	
6	Sf	
7	Sg	
8	K0	Input terminal for key return signal from external key matrix. The output of segment terminals (a ~ g) is used as the key return signal source. 
9	K1	
10	K2	
11	K3	
12	D6	Digit signal output terminal for display. **(Refer to Fig. 7)**
13	D5	
14	D4	
15	D3	
16	D2	
17	D1	
18	MT	This is the output terminal to eliminate shock noise due to unlocking at PLL. When the CE terminal is at low level, the output from this terminal is at high level.  Power "ON" Power "OFF" 700μs 4V 0V Muting "ON" Muting "OFF"
19	X2	Connecting terminal for crystal oscillator. The crystal connected is at 4.5 MHz.
20	X1	
21	VDD	Power supply terminal of the device.
22	E01	Not used in this unit.
23	GND	Ground terminal.
24	E02	When the divided oscillation frequency is higher than the standard frequency, H-level output is delivered from these terminals. When it is lower, L-level (0V) output is delivered. When they coincide, it results in floating.
25	CE	This is the selected signal input terminal of the device. When operating the device, make the level high, and when it is not used, make the level low. When this terminal is at low level, all the segment (a ~ g) and digits (D1 ~ D6) terminals are off, but the memory is held.  Power "ON" Power "OFF" 4V 0V **The device does not operate during this period.**
26	SD	This input terminal detects the reception of a broadcasting station. The voltage is 4.2V during reception, and otherwise 0V.
27	FM	Input terminal for FM OSC output frequency-divided to 1/16 or 1/17 by pre-scaler.
28	PSC	Reference signal for pre-scaler This is the terminal to deliver the frequency dividing ratio changeover output signal to the pre-scaler. The terminal continues to produce pulses at the rise of the signal applied to FM terminal (27) until the content of the inside swallow counter is 0. The frequency dividing radio of prescaler is 1/17. When the swallow counter comes to 0, the terminal level becomes low, then the frequency dividing ratio of pre-scaler is 1/16.  DIV DIV 1/17 1/16 5V 0V 25kHz **Pulse two times larger than the value that cannot be divided by VCO/16.**
29	INT	This is the interrupt demand signal input terminal. The signal from the control input terminal is put into this terminal, demanding for interruption, then the flow of program will be unconditionally shifted to the address No. 1.
30	AM	Input terminal for AM OSC output.  2.8V 1.7V 1 MHz ~ 2 MHz
31	Dp	2-bit input/output. Dp (31) is decimal point indication output terminal for digital indication. Lamp (32) is not used in this unit.
32	Lamp	
33	IF	4-Bit output port. IF (33) is normal/super narrow output terminal 5V in super narrow and 0V in normal. FM (35) is FM/AM output terminal; 5V in FM and 0V in AM. LW (34) and AM (36) not used in this unit.
34	LW	
35	FM	
36	AM	
37	OFF	This is 4-bit input/output port. MONO terminal (38) is the auto/mono changeover output terminal, which is 5V in auto, and 0V in mono. 37 (OFF), 39 (SDC) and 40 (D) not used in this unit.
38	MONO	
39	SDC	
40	D	
41	COMP	1-bit input port. Comparison voltage input terminal, regulating the duty pulses to let it follow the signal voltage.
42	VDP	Variable duty pulse at 1.34 kHz is delivered to compare it with signal voltage.

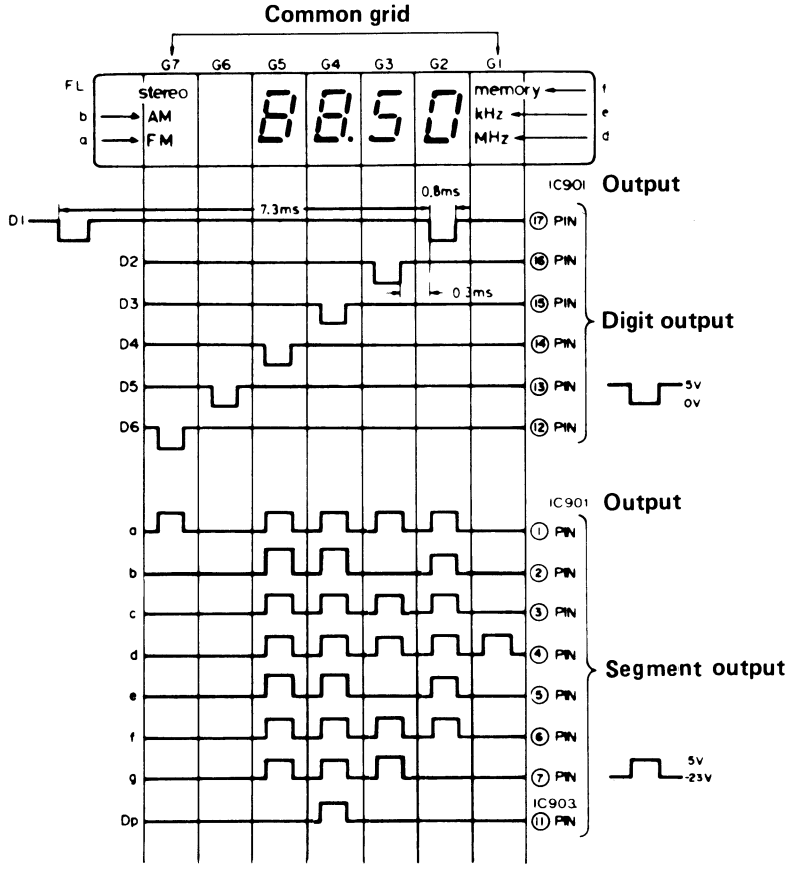
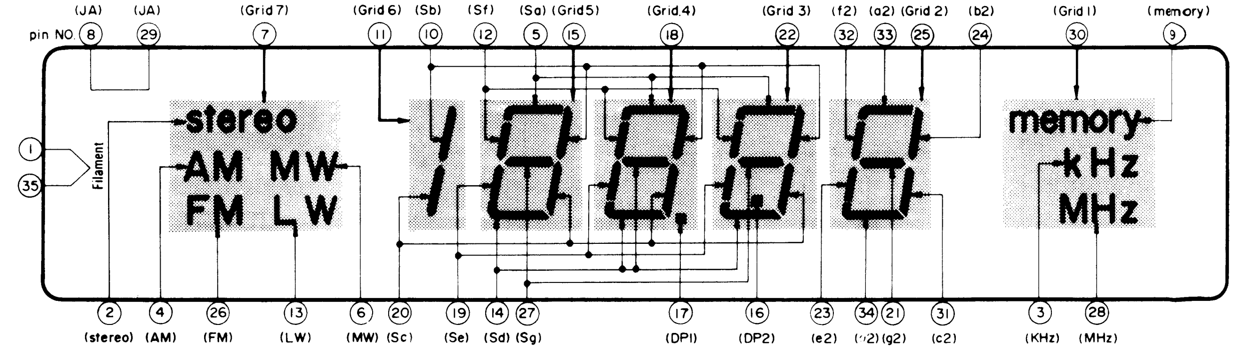
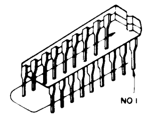
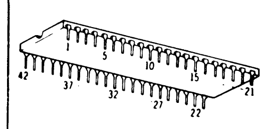
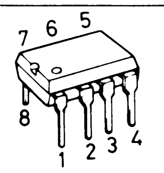
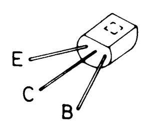
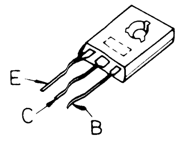

Common grid
G7
G6
G5
G4
G3
G2
G1
FL
b
a
stereo
AM
FM
memory
kHz
MHz
f
e
d
IC901 Output
7.3ms
0.8ms
0.3ms
D1
D2
D3
D4
D5
D6
⑰ PIN
⑯ PIN
⑮ PIN
⑭ PIN
⑬ PIN
⑫ PIN
Digit output
5V
0V
IC901 Output
a
b
c
d
e
f
g
Dp
① PIN
② PIN
③ PIN
④ PIN
⑤ PIN
⑥ PIN
⑦ PIN
IC903
⑪ PIN
Segment output
5V
-23V

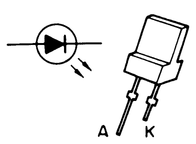
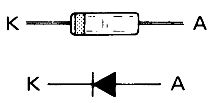
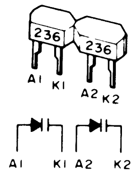
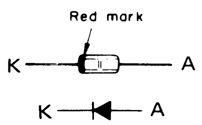
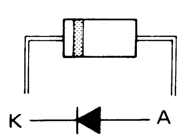
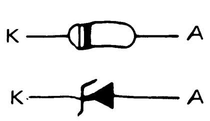
Fig. 7

• Digital frequency display tube (FL)

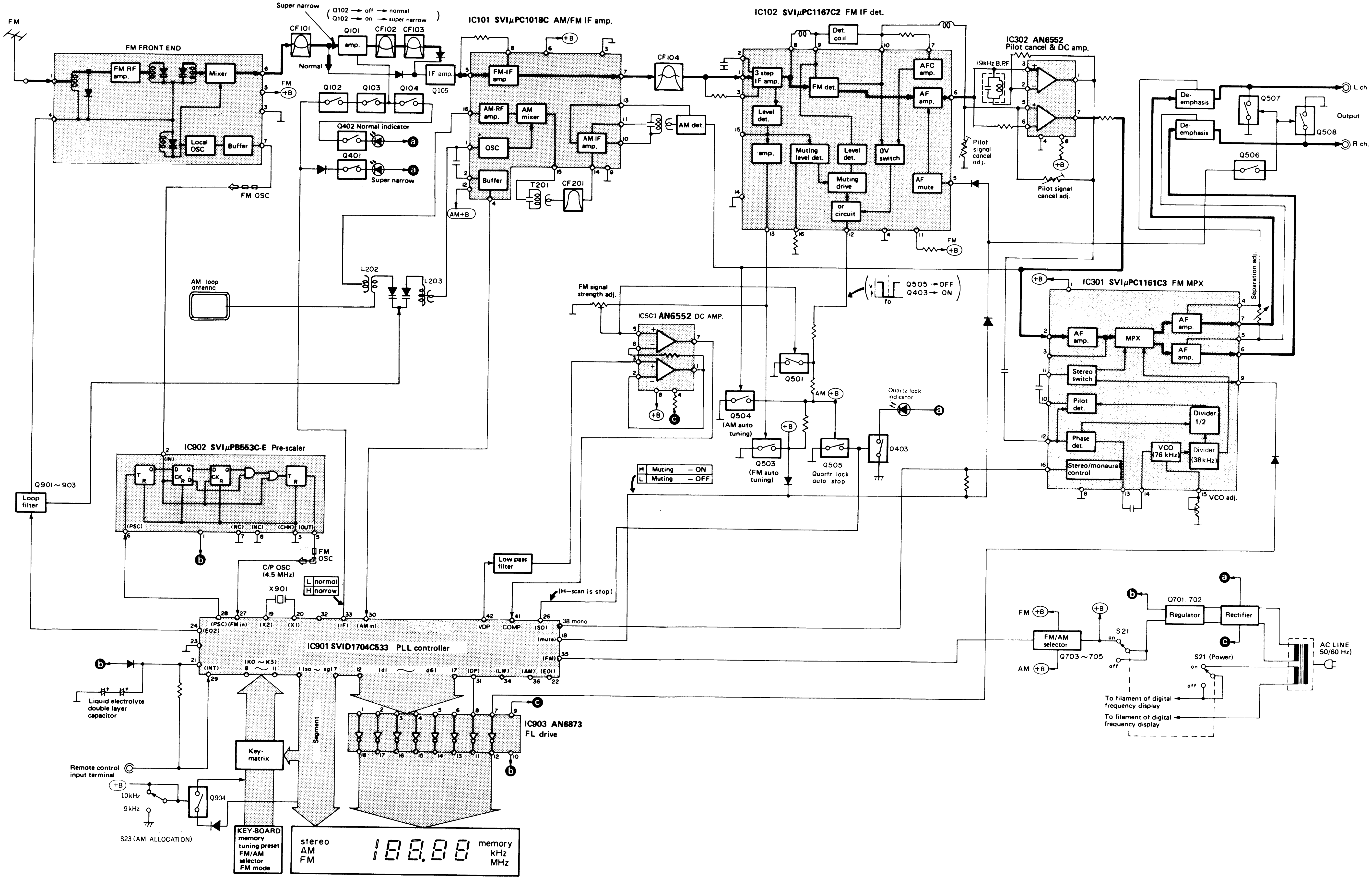

(JA)
(JA)
(Grid 7)
(Grid 6)
(Sb)
(Sf)
(Sa)
(Grid 5)
(Grid 4)
(Grid 3)
(f2)
(a2)
(Grid 2)
(b2)
(Grid 1)
(memory)
pin NO. ⑧
㉙
⑦
⑪
⑩
⑫
⑤
⑮
⑱
㉒
㉜
㉝
㉕
㉔
㉚
⑨
①
㉟
Filament
stereo
AM
MW
FM
LW
memory
kHz
MHz
② (stereo)
④ (AM)
㉖ (FM)
⑬ (LW)
⑥ (MW)
⑳ (Sc)
⑲ (Se)
⑭ (Sd)
㉗ (Sg)
⑰ (DP1)
⑯ (DP2)
㉓ (e2)
㉞ (d2)
㉑ (g2)
㉛ (c2)
③ (KHz)
㉘ (MHz)

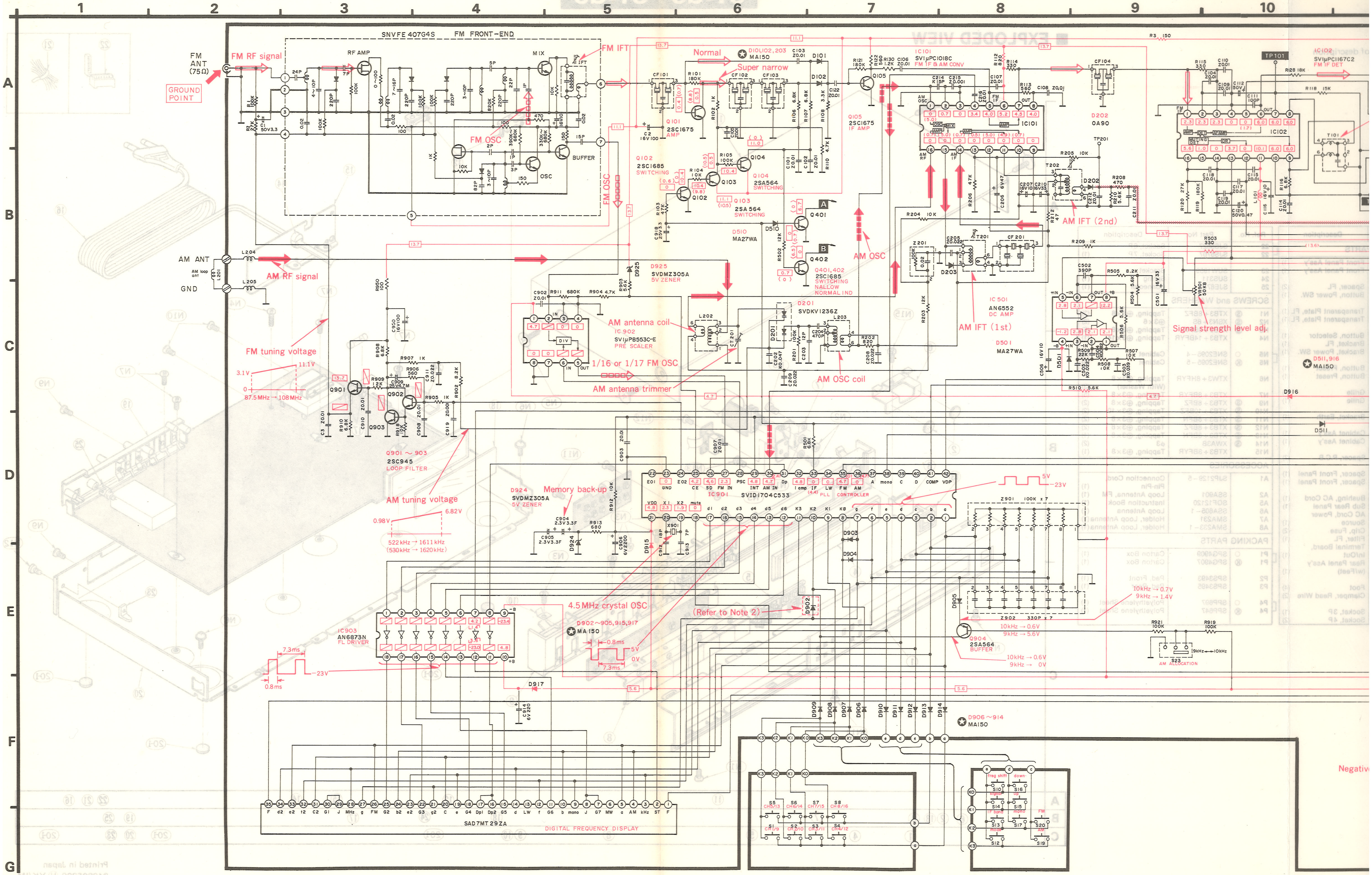
■ TERMINAL GUIDE OF TRANSISTORS, IC'S AND DIODES

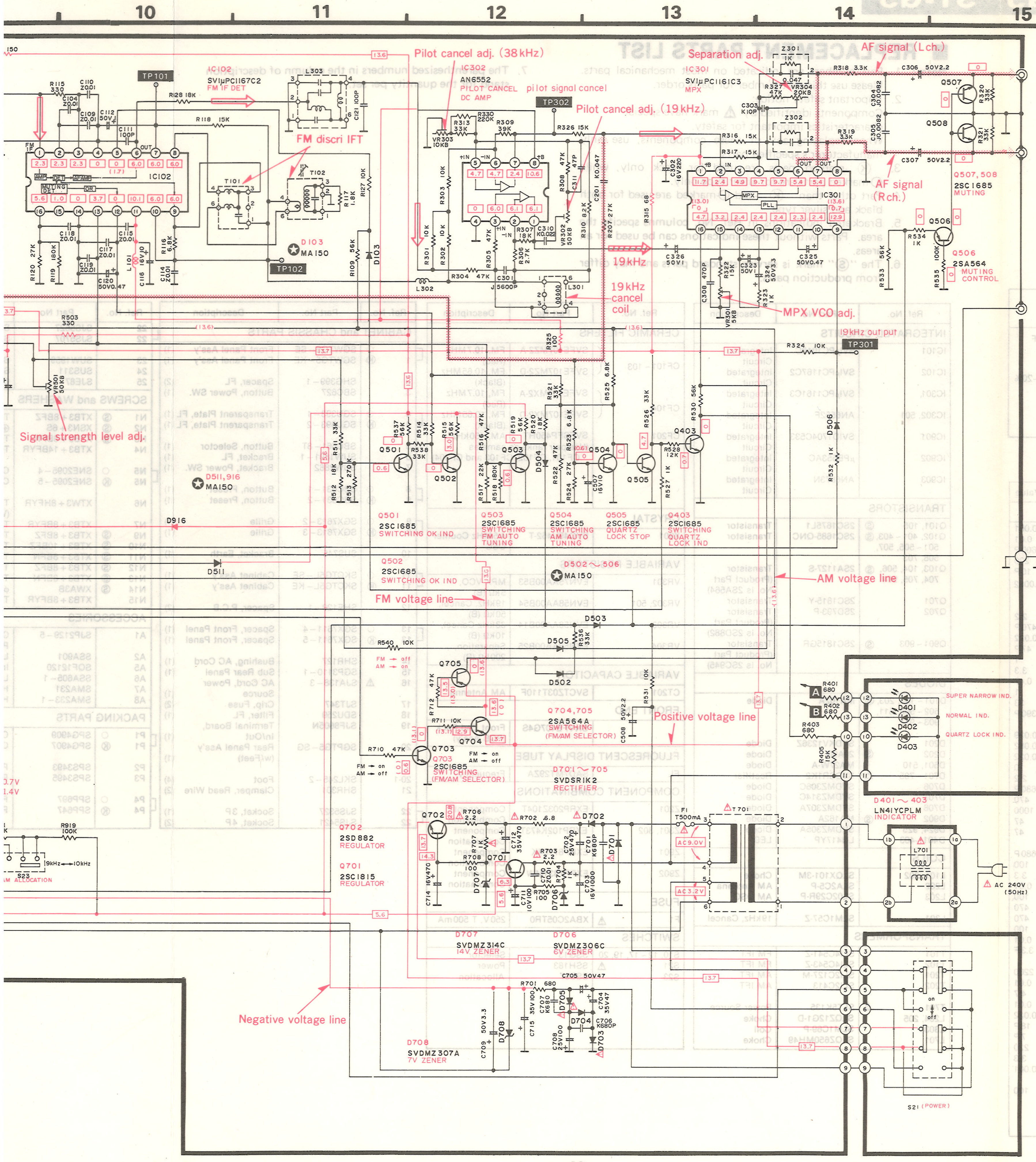
	SVID1704C553	AN6552F, μPB553AC	2SC1675, 2SC1685, 2SA564, 2SC1815, 2SC945	2SD882
 SVIUPC1018C SVIUPC1167C2 SVIUPC1161C3 16 pin AN6873N 18 pin	 1 5 10 15 21 22 27 32 37 42	 	 	

LN417YP	MA150, OA90	SVDKV1236Z	MA27W-A	SVDSR1K2	SVDMZ □□□□
 	 	 236 236 A1 K1 A2 K2 A1 K1 A2 K2	 Red mark K A K A	 	

■ BLOCK DIAGRAM


FM
FM FRONT END
FM RF amp.
Mixer
Local OSC
Buffer
FM OSC
FM +B
Super narrow
(Q102 → off → normal
Q102 → on → super narrow)
CF101
Q101
amp.
CF102
CF103
Normal
IF amp.
Q105
Q102
Q103
Q104
Q402 Normal indicator
Q401
Super narrow
IC101 SVIμPC1018C AM/FM IF amp.
FM-IF amp
AM-RF amp.
AM mixer
OSC
AM-IF amp.
Buffer
AM det.
T201
CF201
AM+B
CF104
IC102 SVIμPC1167C2 FM IF det.
Det. coil
3 step IF amp.
FM det.
AFC amp.
AF amp.
Level det.
amp.
Muting level det.
Level det.
0V switch
Muting drive
or circuit
AF mute
IC302 AN6552
Pilot cancel & DC amp.
19kHz B.P.F
Pilot signal cancel adj.
Pilot signal cancel adj.
De-emphasis
De-emphasis
Q507
Q508
Q506
L ch
R ch.
Output
Separation adj.
IC301 SVIμPC1161C3 FM MPX
AF amp.
MPX
AF amp.
AF amp.
Stereo switch
Pilot det.
Divider 1/2
Phase det.
VCO (76 kHz)
Divider (38kHz)
Stereo/monaural control
VCO adj.
L202
L203
AM loop antenna
FM signal strength adj.
IC5C1 AN6552 DC AMP.
Q505 → OFF
Q403 → ON
fo
Q501
AM +B
Q504 (AM auto tuning)
Q503 (FM auto tuning)
Q505 Quartz lock auto stop
Q403
Quartz lock indicator
H Muting – ON
L Muting – OFF
IC902 SVIμPB553C-E Pre-scaler
(IN) (PSC) (NC) (NC) (CHK) (OUT)
Q901～903
Loop filter
FM OSC
C/P OSC (4.5 MHz)
X901
L normal
H narrow
Low pass filter
(H-scan is stop)
IC901 SVID1704C533 PLL controller
(PSC) (FM in) (X2) (X1) (IF) (AM in) VDP COMP (SD) 38 mono (mute) (FM)
(EO2) (INT) (KO ～ K3) (sa ～ sg) (d1 ～ d6) (DP) (LW) (AM) (EO1)
Liquid electrolyte double layer capacitor
Remote control input terminal
+B
10kHz
9kHz
Q904
S23 (AM ALLOCATION)
Key-matrix
Segment
IC903 AN6873 FL drive
KEY-BOARD memory tuning-preset FM/AM selector FM mode
stereo AM FM
188.88
memory kHz MHz
Q701, 702
Regulator
Rectifier
AC LINE 50/60 Hz
FM +B
AM +B
FM/AM selector
Q703～705
S21
on
off
S21 (Power)
To filament of digital frequency display
To filament of digital frequency display


1
2
3
4
5
6
7
8
9
10
A
B
C
D
E
F
G
SNVFE 407G4S FM FRONT-END
FM ANT (75Ω)
GROUND POINT
FM RF signal
RF AMP
MIX
BUFFER
OSC
FM OSC
FM IFT
Normal
Super narrow
D101,102,203 MA150
Q101 2SC1675 AMP
Q102 2SC1685 SWITCHING
Q103 2SA564 SWITCHING
Q104 2SA564 SWITCHING
Q105 2SC1675 IF AMP
IC101 SVIμPC1018C FM IF & AM CONV
IC102 SVIμPC1167C2 FM IF DET
TP101
D202 OA90
AM IFT (2nd)
AM IFT (1st)
AM OSC
AM OSC coil
Q401 A
Q402 B
Q401,402 2SC1685 SWITCHING NALLOW NORMAL IND
D510 MA27WA
D925 SVDMZ305A 5V ZENER
AM ANT
AM loop ant
GND
AM RF signal
IC902 SVIμPB553C-E PRE SCALER
1/16 or 1/17 FM OSC
AM antenna coil
AM antenna trimmer
D201 SVDKV1236Z
IC501 AN6552 DC AMP
D501 MA27WA
Signal strength level adj.
FM tuning voltage
3.1V
11.1V
87.5MHz → 108MHz
Q901 ~ 903 2SC945 LOOP FILTER
AM tuning voltage
0.98V
6.82V
522kHz → 1611kHz (530kHz → 1620kHz)
D924 SVDMZ305A 5V ZENER
Memory back-up
IC901 SVID1704C533 PLL CONTROLLER
4.5MHz crystal OSC
D902~905,915,917 MA150
(Refer to Note 2)
IC903 AN6873N FL DRIVER
7.3ms
0.8ms
−23V
5V
0V
Z901 100K × 7
Z902 330P × 7
10kHz → 0.7V
9kHz → 1.4V
Q904 2SA564 BUFFER
10kHz → 0.6V
9kHz → 5.6V
10kHz → 0.6V
9kHz → 0V
S23 AM ALLOCATION
9kHz 10kHz
D916
D511
D906 ~ 914 MA150
SAD7MT29ZA DIGITAL FREQUENCY DISPLAY
S1 CH1/9
S2 CH2/10
S3 CH3/11
S4 CH4/12
S5 CH5/13
S6 CH6/14
S7 CH7/15
S8 CH8/16
S10
S12
S13
S14
S15
S16
S17
S19
S20
freq shift
down
up
FM
AM
mono
IF band
memo
Negativ


10
11
12
13
14
15
16
Pilot cancel adj. (38 kHz)
Separation adj.
AF signal (L ch.)
Pilot cancel adj. (19 kHz)
FM discri IFT
AF signal (R ch.)
19 kHz
19 kHz cancel coil
MPX VCO adj.
19 kHz out put
IC102 SVIμPC1167C2 FM IF DET
IC302 AN6552 PILOT CANCEL DC AMP
pilot signal cancel
IC301 SVIμPC1161C3 MPX
TP101
TP102
TP301
TP302
D103 MA150
Q507, 508 2SC1685 MUTING
Q506 2SA564 MUTING CONTROL
L ch
OUTPUT
R ch
REMOTE CONTROL
Signal strength level adj.
D511, 916 MA150
Q501 2SC1685 SWITCHING OK IND.
Q502 2SC1685 SWITCHING OK IND.
Q503 2SC1685 SWITCHING FM AUTO TUNING
Q504 2SC1685 SWITCHING AM AUTO TUNING
Q505 2SC1685 QUARTZ LOCK STOP
Q403 2SC1685 SWITCHING QUARTZ LOCK IND.
D502～506 MA150
AM voltage line
FM voltage line
Positive voltage line
Q703 2SC1685 SWITCHING (FM/AM SELECTOR)
Q704, 705 2SA564A SWITCHING (FM/AM SELECTOR)
D701～705 SVDSR1K2 RECTIFIER
SUPER NARROW IND.
NORMAL IND.
QUARTZ LOCK IND.
D401～403 LN41YCPLM INDICATOR
Q702 2SD882 REGULATOR
Q701 2SC1815 REGULATOR
T701
F1 T500mA
AC 240V (50Hz)
D707 SVDMZ314C 14V ZENER
D706 SVDMZ306C 6V ZENER
D708 SVDMZ307A 7V ZENER
Negative voltage line
S23 AM ALLOCATION
9kHz←→10kHz
S21 (POWER)

SCHEMATIC DIAGRAM

(This schematic diagram may be modified at any time with the development of new technology.)

* The part No. of transistors, IC and diodes mentioned in the schematic diagram stand for production part No. Regarding the part No. with ✪ mark, the production part No. are different from the replacement part No. Therefore, when placing an order for replacement part please use the part No. in the replacement part list.

Note1:

1. **S1 ～ S8** : Preset tuning switch.
   1 ～ 16 CH
2. **S10** : FM frequency shift switch. (off ←→ +25 kHz)
3. **S12** : FM mode switch. (auto ←→ mono)
4. **S13** : FM IF band selector switch.
   normal ←→ super narrow
5. **S14** : FM signal-strength indicator switch.
   off ←→ on
6. **S15** : Tuning (up) switch.
   [up : tuning to higher frequency]
7. **S16** : Tuning (down) switch.
   [down : tuning to lower frequency]
8. **S17** : Memory switch. (manual ←→ auto)
9. **S19** : AM selector switch.
10. **S20** : FM selector switch.
11. **S21** : Power source switch in "**on**" position.
12. **S23** : AM (MW) allocation switch in "**10 kHz step**" position.
    9 kHz step ←→ 10 kHz step

13. Indicated voltage values are the standard values for the unit measured by the DC electronic circuit tester (high-impedance) with the chassis taken as standard. Therefore, there may exist some errors in the voltage values, depending on the internal impedance of the DC circuit tester.
    - * Figures in ▭ stand for DC voltage in FM signal (monaural) reception mode.
    - * Figures in ⌜ ⌟ stand for DC voltage in FM stereo signal reception mode.
    - * Figures in ( ) stand for DC voltage in AM signal reception mode.
    - * Figures in < > stand for DC voltage in super narrow condition mode

14. — Positive and negative voltage lines. ⇢ AF signal lines
    ⇨ FM signal ▭▭▭⇨ FM OSC
    ➡ AM signal ■■■➡ AM OSC

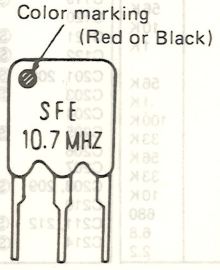
15. Important safety notice:
    Components identified by ⚠ mark have special characteristics important for safety.
    When replacing any of these components, use only manufacturer's specified parts.

Note 2:

● Use of ceramic filters in pairs

The ceramic filters (CF101 ～ CF104) for FM-IF circuit are available in two ranks. For this machine, be sure to use the ceramics of the same rank in a pair.

At repairing and replacement, pay close attention to the diode (D902) for use as different diodes must be used depending on each rank of the ceramic filters.


Color marking
(Red or Black)
SFE
10.7 MHz

RANK (Color)	D902	CENTER FREQUENCY
Black	○	10.65 MHz
Red	X	10.70 MHz

Note: ○ Mark Diode is used.
X Mark Diode is not used.

■ RESISTORS AND CAPACITORS

Notes.
1. Part numbers are indicated on most mechanical parts. Please use this part number for parts order.
2. Important safety notice. Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.
3. The "Ⓢ" mark is service standard parts and may differ from production parts.
4. The unit of resistance is OHM (Ω). K = 1000Ω M = 1000kΩ
5. The unit of capacitance is MICROFARAD (μF) P = 10^{-6} μF

Numbering System of Resistor

Example

ERD	25	F	J	101
Type	Wattage	Shape	Tolerance	Value

Resistor Type	Wattage	Tolerance
ERD : Carbon	25 : 1/4W S1 : 1/2W	J : ± 5%

Numbering System of Capacitor

Example

ECKD	1H	102	Z	F
Type	Voltage	Value	Tolerance	Peculiarity
ECEA	50	M	R47	R·
Type	Voltage	Peculiarity use	Value	Special use

Capacitor Type	Voltage		Tolerance
	ECEA Type	Other	
ECEA : Electrolytic	OJ : 6.3V	1H : 50V DC	C : ± 0.25pF
ECCD : Ceramic	1A : 10V	2H : 500V DC	J : ± 5%
ECKD : Ceramic	1C : 16V	2R3 : 2.3V DC	K : ± 10%
ECQM : Polyester	1E : 25V		Z : +80%, −20%
ECQP : Polypropylene	1H : 50V		
EECW : Liquid electrolyte double layer capacitor	50 : 50V 25 : 25V 1V : 35V		

Ref. No.	Part No.	Value
RESISTORS		
R1 Ⓢ	ERD25TJ104	100K
R2 Ⓢ	ERD25TJ273	27K
R3 Ⓢ	ERD25FJ151	150
R101 Ⓢ	ERD25TJ184	180K
R102 Ⓢ	ERD25FJ102	1K
R103 Ⓢ	ERD25TJ473	47K
R104 Ⓢ	ERD25FJ103	10K
R105 Ⓢ	ERD25TJ104	100K
R106, 107 Ⓢ	ERD25FJ682	6.8K
R108 Ⓢ	ERD25FJ332	3.3K
R109 Ⓢ	ERD25TJ563	56K
R110 Ⓢ	ERD25FJ472	4.7K
R112 Ⓢ	ERD25FJ821	820
R113 Ⓢ	ERD25FJ561	560
R114, 115 Ⓢ	ERD25FJ331	330
R116 Ⓢ	ERD25FJ682	6.8K
R117 Ⓢ	ERD25FJ182	1.8K
R118 Ⓢ	ERD25TJ153	15K
R119 Ⓢ	ERD25TJ184	180K
R120 Ⓢ	ERD25TJ273	27K
R121 Ⓢ	ERD25TJ184	180K
R127 Ⓢ	ERD25FJ103	10K
R128 Ⓢ	ERD25TJ183	18K
R130 Ⓢ	ERD25FJ122	1.2K
R201 Ⓢ	ERD25TJ104	100K
R202 Ⓢ	ERD25FJ821	820
R203 Ⓢ	ERD25TJ123	12K
R204, 205 Ⓢ	ERD25FJ103	10K
R206 Ⓢ	ERD25TJ473	47K
R207 Ⓢ	ERD25TJ273	27K
R208 Ⓢ	ERD25FJ471	470
R209 Ⓢ	ERD25FJ102	1K
R210 Ⓢ	ERD25FJ562	5.6K
R212 Ⓢ	ERD25FJ470	47
R301, 302 Ⓢ	ERD25FJ103	10K
R303 Ⓢ	ERD25FJ103	10K
R304, 305 Ⓢ	ERD25TJ473	47K
R306 Ⓢ	ERD25FJ272	2.7K
R307 Ⓢ	ERD25TJ183	18K
R308 Ⓢ	ERD25TJ473	47K
R309 Ⓢ	ERD25TJ393	39K
R310 Ⓢ	ERD25FJ822	8.2K
R313 Ⓢ	ERD25TJ333	33K
R315 ⚠ Ⓢ	ERD25FJ680	68
R316, 317 Ⓢ	ERD25TJ153	15K
R318, 319 Ⓢ	ERD25FJ332	3.3K
R320, 321 Ⓢ	ERD25TJ333	33K
R322 Ⓢ	ERD25TJ153	15K
R323 Ⓢ	ERD25FJ102	1K
R324 Ⓢ	ERD25FJ103	10K
R325 Ⓢ	ERD25FJ101	100
R326 Ⓢ	ERD25TJ153	15K
R327 Ⓢ	ERD25TJ473	47K
R330 Ⓢ	ERD25TJ224	220K
R401, 402 Ⓢ	ERD25FJ681	680
R403 Ⓢ	ERD25FJ681	680
R405 Ⓢ	ERD25TJ153	15K
R501 Ⓢ	ERD25FJ682	6.8K
R502 Ⓢ	ERD25TJ123	12K
R503 Ⓢ	ERD25FJ331	330
R504 Ⓢ	ERD25FJ562	5.6K
R505 Ⓢ	ERD25FJ822	8.2K
R506 Ⓢ	ERD25FJ562	5.6K
R507, 508 Ⓢ	ERD25FJ103	10K
R509 Ⓢ	ERD25TJ223	22K
R510 Ⓢ	ERD25FJ562	5.6K
R511 Ⓢ	ERD25TJ333	33K
R512 Ⓢ	ERD25TJ183	18K
R513 Ⓢ	ERD25TJ274	270K
R514 Ⓢ	ERD25TJ333	33K
R515 Ⓢ	ERD25TJ563	56K
R516 Ⓢ	ERD25TJ473	47K
R517 Ⓢ	ERD25TJ223	22K
R518 Ⓢ	ERD25TJ683	68K
R519 Ⓢ	ERD25TJ563	56K
R520 Ⓢ	ERD25TJ183	18K
R521 Ⓢ	ERD25TJ333	33K
R522 Ⓢ	ERD25TJ473	47K
R523 Ⓢ	ERD25FJ682	6.8K
R524 Ⓢ	ERD25TJ273	27K
R525 Ⓢ	ERD25FJ682	6.8K
R526 Ⓢ	ERD25TJ333	33K
R527 Ⓢ	ERD25FJ102	1K
R528 Ⓢ	ERD25TJ123	12K
R530 Ⓢ	ERD25TJ563	56K
R531 Ⓢ	ERD25FJ103	10K
R532 Ⓢ	ERD25FJ102	1K
R533 Ⓢ	ERD25TJ563	56K
R534 Ⓢ	ERD25FJ102	1K
R535 Ⓢ	ERD25TJ104	100K
R536 Ⓢ	ERD25TJ333	33K
R537 Ⓢ	ERD25TJ563	56K
R538 Ⓢ	ERD25TJ333	33K
R540 Ⓢ	ERD25FJ103	10K
R701 Ⓢ	ERD25FJ681	680
R702 ⚠ Ⓢ	ERD25FJ6R8	6.8
R703 ⚠ Ⓢ	ERD25FJ2R2	2.2
R704 Ⓢ	ERD25FJ102	1K
R705 Ⓢ	ERD25FJ101	100
R706 ⚠ Ⓢ	ERD25FJ2R2	2.2
R707 ⚠	ERDS1FJ102	1K
R708 Ⓢ	ERD25FJ101	100
R710 Ⓢ	ERD25TJ473	47K
R711 Ⓢ	ERD25FJ103	10K
R712 Ⓢ	ERD25TJ473	47K
R902 Ⓢ	ERD25FJ822	8.2K
R903 Ⓢ	ERD25FJ562	5.6K
R904 Ⓢ	ERD25FJ472	4.7K
R905 Ⓢ	ERD25FJ102	1K
R906 Ⓢ	ERD25FJ561	560
R907 Ⓢ	ERD25FJ102	1K
R908 Ⓢ	ERD25FJ682	6.8K
R909 Ⓢ	ERD25TJ123	12K
R910 Ⓢ	ERD25FJ682	6.8K
R911 Ⓢ	ERD25TJ684	680K
R912 Ⓢ	ERD25FJ103	10K
R913 Ⓢ	ERD25FJ681	680
R918 Ⓢ	ERD25FJ103	10K
R919 Ⓢ	ERD25TJ104	100K
R921 Ⓢ	ERD25TJ104	100K
R950 Ⓢ	ERD25FJ101	100
CAPACITORS		
C1	ECEA1HU3R3	3.3
C2	ECEA1CU101	100
C3 Ⓢ	ECKD1H103ZF	0.01
C101, 102 Ⓢ	ECKD1H103ZF	0.01
C103, 104 Ⓢ	ECKD1H103ZF	0.01
C105, 106 Ⓢ	ECKD1H103ZF	0.01
C107, 108 Ⓢ	ECKD1H103ZF	0.01
C109, 110 Ⓢ	ECKD1H103ZF	0.01
C111 Ⓢ	ECCD1H101K	100P
C112	ECEA1HU010	1
C114, 115 Ⓢ	ECKD1H103ZF	0.01
C116	ECEA1CU100	10
C117, 118 Ⓢ	ECKD1H103ZF	0.01
C119 Ⓢ	ECKD1H103ZF	0.01
C120	ECEA1HUR47	0.47
C121 Ⓢ	ECCD1H101KC	100P
C122 Ⓢ	ECKD1H103ZF	0.01
C201, 202 Ⓢ	ECQM1H473JZ	0.047
C203 Ⓢ	ECCD1H120KC	12P
C204	ECQP1471JZ	470P
C205 Ⓢ	ECKD1H223ZF	0.022
C206	ECEA0JU470	47
C207	ECEA1CU100	10
C208, 209 Ⓢ	ECKD1H223ZF	0.022
C210	ECEA1CU330	33
C211, 212 Ⓢ	ECKD1H103ZF	0.01
C214 Ⓢ	ECCD1H150KC	15P
C215 Ⓢ	ECKD1H102ZF	0.001
C216 Ⓢ	ECKD1H103ZF	0.01
C301	ECQP1562JZ-T	5600P
C302	ECEA1CU221	220
C303 Ⓢ	ECCD1H100KC	10P
C304, 305 Ⓢ	ECQM1H822JZ	0.0082
C306, 307	ECEA1HU2R2	2.2
C308	ECQP1471JZ	470P
C310 Ⓢ	ECQM1H223JZ	0.022
C311 Ⓢ	ECCD1H470K	47P
C323	ECEA1HU010	1
C324	ECEA1HU3R3	3.3
C325	ECEA1HUR47	0.47
C326	ECEA1HU010	1
C501	ECEA1CU330	33
C502 Ⓢ	ECKD1H391KB	390P
C503	ECQM1H393KV	0.039
C504 Ⓢ	ECQM1H823JZ	0.082
C505 Ⓢ	ECQM1H223JZ	0.022
C506, 507	ECEA1CU100	10
C508	ECEA1HU2R2	2.2
C701	ECKD2H681KB	680P
C702	ECEA1EU471	470
C703	ECEA1CU102	1000
C704	ECEA1VU470	47
C705	ECEA1HU470	47
C706, 707	ECKD2H681KB	680P
C708	ECEA1EU101	100
C709	ECEA1HU3R3	3.3
C710 Ⓢ	ECKD1H103ZF	0.01
C711	ECEA1AU101	100
C712	ECEA1VU471	470
C714	ECEA1CU471	470
C715	ECEA1VU101	100
C902, 903 Ⓢ	ECKD1H103ZF	0.01
C904, 905	EECW2R3A3R3	3.3F
C906	ECEA0JU222	2200
C907, 908 Ⓢ	ECKD1H103ZF	0.01
C909 Ⓢ	ECEA25M4R7R	4.7
C910 Ⓢ	ECKD1H103ZF	0.01
C911 Ⓢ	ECKD1H223ZF	0.022
C912 Ⓢ	ECCD1H180KC	18P
C913 Ⓢ	ECCD1H070CC	7P
C914	ECEA0JU221	220
C918	ECEA1EU3R3	3.3
C919 Ⓢ	ECKD1H102ZF	0.001
C950	ECEA1CU101	100

■ REPLACEMENT PARTS LIST

Notes:
1. Part numbers are indicated on most mechanical parts. Please use this part number for parts order.
2. Important safety notice: Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
3. Ⓚ -marked parts are used for black only, while ○-marked parts are for silver type only.
4. Part other than Ⓚ -and ○-marked are used for both black and silver type.
5. Bracketed indications in Ref. No. columns specify the area. Parts without these indications can be used for all areas.
6. The "Ⓢ" mark is service standard parts and may differ from production parts.
7. The parenthesized numbers in the column of description stand for the quantity per set.

Ref. No.	Part No.	Description
INTEGRATED CIRCUITS		
IC101	SVIμPC1018C	Integrated Circuit
IC102	SVIμPC1167C2	Integrated Circuit
IC301	SVIμPC1161C3	Integrated Circuit
IC302, 501	AN6552F	Integrated Circuit
IC901	SVID1704C533	Integrated Circuit
IC902	μPB553AC	Integrated Circuit
IC903	AN6873N	Integrated Circuit
TRANSISTORS		
Q101, 105 Ⓢ	2SC1675L1	Transistor
Q102, 401 ~ 403, 501 ~ 505, 507, 508, 703 Ⓢ	2SC1685-QNC	Transistor
Q103, 104, 506, 704, 705, 904 Ⓢ	2SA1127-S	Transistor (Product Part No. is 2SA564)
Q701	2SC1815-Y	Transistor
Q702	2SD793-P	Transistor (Product Part No. is 2SD882)
Q901 ~ 903 Ⓢ	2SC1815GR	Transistor (Product Part No. is 2SC945)
DIODES		
D101 ~ 103, 203, 502 ~ 506, 511, 903 ~ 917 Ⓢ	MA162A	Diode
D201	SVDKV1236Z	Diode
D202 Ⓢ	20A90	Diode
D501, 510	MA27W-A	Diode
D701 ~ 705 ⚠	SVDSR1K2	Rectifier
D706	SVDMZ306C	Diode
D707	SVDMZ314C	Diode
D708	SVDMZ307A	Diode
D902 Ⓢ	MA162A	Diode
D924, 925	SVDMZ305A	Diode
D401~403	LN417YP	LED
COILS		
L101, 302	SLQX101-3M	Choke
L202	SLA2C5-P	AM Antenna
L203	SL02C29R-P	AM OSC
L301	SLM1C57-Z	19kHz, Cancel
TRANSFORMERS		
T101	SLI4C541-Z	FM IFT
T102	SLI4C543-Z	FM IFT
T201	SLI2C127-M	AM IFT
T202	SLI2C413	AM IFT
T701 ⚠	SLT5K135	Power Source
L204, 205	SLQZ12G1-D	Choke
L303	SLM1C69-P	Coil
L701	SLQZ650MH49	Choke
CERAMIC FILTERS		
CF101 ~ 103	SVFE107MZ2-A	FM, 10.7MHz (Red)
	SVFE107MZ2-D	FM, 10.65MHz (Black)
CF104	SVFE107MX2-A	FM, 10.7MHz (Red)
	SVFE107MX2-D	FM, 10.65MHz (Black)
CF201	SVFSFP450HT	AM, 450kHz
	(Use pair ranks as same as CF101, CF102, CF103 and CF104)	
CRYSTAL		
X901	SVQ49U452-T	4.5MHz Counter OSC
VARIABLE RESISTORS		
VR301	EVN75AA00B53	MPX VCO, 5kΩ (B)
VR302, 501	EVN58AA00B54	19kHz, Cancel, 50kΩ (B)
VR303	EVN58AA00B14	38kHz Cancel, 10kΩ (B)
VR304	EVN58AA00B25	Separation, 200kΩ (B)
VARIABLE CAPACITOR		
CT201	SVCTZ03T110F	AM Antenna
FRONT END		
	SNVFE407G4S	Front End Pack (PCB Ass'y)
FLUORESCENT DISPLAY TUBE		
FL	SAD7MT29ZA	Frequency
COMPONENT COMBINATIONS		
Z201	EXRP203Z104T	Component Combination
Z301, 302	EXRP102K473T	Component Combination
Z901	EXBP87104K	Component Combination
Z902	EXFP7331MW	Component Combination
FUSE		
F1 ⚠	XBA2C05TR0	250V, T 500mA
SWITCHES		
S10, 12 ~ 17, 19, 20	SSG13	Selector
S21 ⚠	SSH183	Power
S23	SSS67	Allocation

Ref. No.	Part No.	Description
CABINET and CHASSIS PARTS		
1 ○	SGWTG5 – SE	Front Panel Ass'y (1)
1 Ⓚ	SGWTG5 – KE	Front Panel Ass'y (1)
2	SHG399 – 1	Spacer, FL (2)
3	SBC627	Button, Power SW. (1)
4 ○	SGU393 – 1	Transparent Plate, FL (1)
4 Ⓚ	SGU393 – 2	Transparent Plate, FL (1)
5	SBC561 – 8T	Button, Selector (1)
6	SUW1891 – 1	Bracket, FL (1)
7	SUW2862	Bracket, Power SW. (1)
8 ○	SBC631 – 1	Button, Preset (1)
8 Ⓚ	SBC631 – 2	Button, Preset (1)
9 ○	SGX7613 – 2	Grille (1)
9 Ⓚ	SGX7613 – 3	Grille (1)
10	SUS745	Bracket, Earth (1)
11 ○	SKCTG5L – SE	Cabinet Ass'y (1)
11 Ⓚ	SKCTG5L – KE	Cabinet Ass'y (1)
12	SHE129 – 1	Spacer, P.C.B (2)
13 ○	SGX7611 – 4	Spacer, Front Panel (1)
13 Ⓚ	SGX7611 – 5	Spacer, Front Panel (1)
14	SHR127	Bushing, AC Cord (1)
15	SGP3110 – 1	Sub Rear Panel (1)
16 ⚠	SJA138 – 3	AC Cord, Power Source (1)
17	SJT347	Crip, Fuse (2)
18	SDU259	Filter, FL (1)
19	SJF8605N	Terminal Board, In/Out (1)
20	SGPTG5 – SG	Rear Panel Ass'y (w/Feet) (1)
20-1	SKL245 – 2	Foot (4)
21	SHR301	Clamper, Read Wire (2)
22	SJS5327	Socket, 3P (1)
22	SJS5421	Socket, 4P (2)

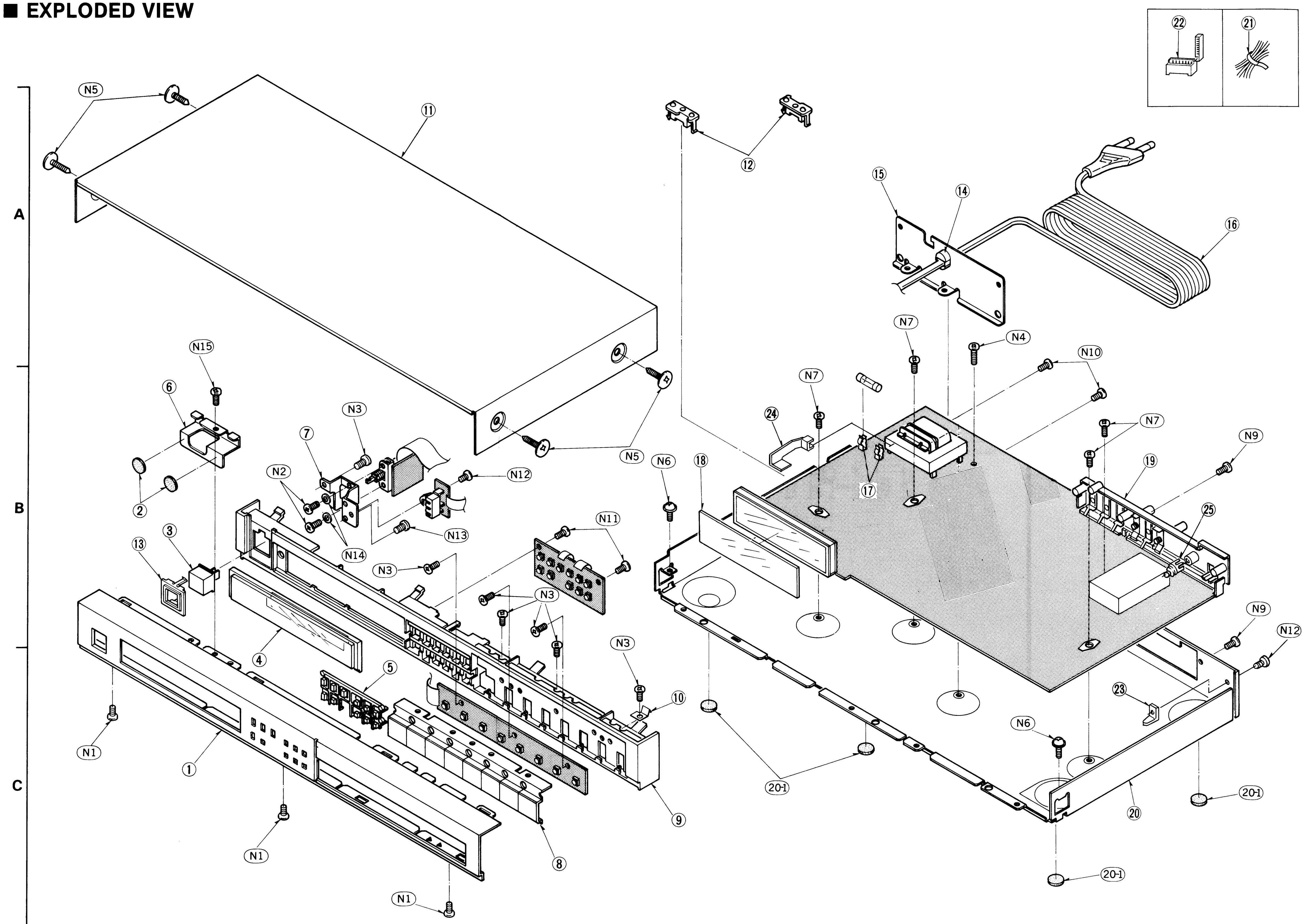
Ref. No.	Part No.	
22	SJS5627	So
22	SJS5707	So
23	SUW1959	Bra
24	SUS311	Spr
25	SJE87	Co
SCREWS and WASHERS		
N1 Ⓢ	XTB3 + 8BFZ	Ta
N2 Ⓢ	XSN3 + 6S	⊕3
N3 Ⓢ	XTB3 + 8BFN	Ta
N4	XTB3 + 14BFYR	Ta
N5 ○	SNE2095 – 4	Ca
N5 Ⓚ	SNE2095 – 5	Ca
N6	XTW3 + 8HFYR	Ta (Wi
N7	XTB3 + 8BFYR	Ta
N9 Ⓢ	XTB3 + 8BFZ	Ta
N10 Ⓢ	XTB3 + 10BFZ	Ta
N11 Ⓢ	XTB3 + 8BFN	Ta
N12 Ⓢ	XTB3 + 8BFZ	Ta
N13 Ⓢ	XTB3 + 8BFN	Ta
N14 Ⓢ	XWA3B	φ3
N15	XTB3 + 8BFYR	Ta
ACCESSORIES		
A1	SJP2129 – 5	Co Pin
A2	SSA901	Lo
A5	SQF12120	Ins
A6	SSA605 – 1	Lo
A7	SMA231	Ho
A8	SMA233 – 1	Ho
PACKING PARTS		
P1 ○	SPG4909	Ca
P1 Ⓚ	SPG4907	Ca
P2	SPS3493	Pa
P3	SPS3495	Pa
P4 ○	SPP697	Po
P4 Ⓚ	SPP647	Po

of description

Description
PARTS
Front Panel Ass'y (1)
Front Panel Ass'y (1)
Spacer, FL (2)
Button, Power SW. (1)
Transparent Plate, FL (1)
Transparent Plate, FL (1)
Button, Selector (1)
Bracket, FL (1)
Bracket, Power SW. (1)
Button, Preset (1)
Button, Preset (1)
Grille (1)
Grille (1)
Bracket, Earth (1)
Cabinet Ass'y (1)
Cabinet Ass'y (1)
Spacer, P.C.B (2)
Spacer, Front Panel (1)
Spacer, Front Panel (1)
Bushing, AC Cord (1)
Sub Rear Panel (1)
AC Cord, Power Source (1)
Crip, Fuse (2)
Filter, FL (1)
Terminal Board, In/Out (1)
Rear Panel Ass'y (w/Feet) (1)
Foot (4)
Clamper, Read Wire (2)
Socket, 3P (1)
Socket, 4P (2)

Ref. No.		Part No.	Description	
22		SJS5627	Socket, 6P	(1)
22		SJS5707	Socket, 7P	(1)
23		SUW1959	Bracket	(1)
24		SUS311	Spring	(1)
25		SJE87	Connector	(1)
SCREWS and WASHERS				
N1	Ⓢ	XTB3 + 8BFZ	Tapping, ⊕3×8	(3)
N2	Ⓢ	XSN3 + 6S	⊕3×6	(2)
N3	Ⓢ	XTB3 + 8BFN	Tapping, ⊕3×8	(6)
N4		XTB3 + 14BFYR	Tapping, ⊕3×14	(1)
N5	○	SNE2095 – 4	Cabinet	(4)
N5	Ⓚ	SNE2095 – 5	Cabinet	(4)
N6		XTW3 + 8HFYR	Tapping, ⊕3×8 (With Washer)	(3)
N7		XTB3 + 8BFYR	Tapping, ⊕3×8	(5)
N9	Ⓢ	XTB3 + 8BFZ	Tapping, ⊕3×8	(2)
N10	Ⓢ	XTB3 + 10BFZ	Tapping, ⊕3×10	(2)
N11	Ⓢ	XTB3 + 8BFN	Tapping, ⊕3×8	(2)
N12	Ⓢ	XTB3 + 8BFZ	Tapping, ⊕3×8	(2)
N13	Ⓢ	XTB3 + 8BFN	Tapping, ⊕3×8	(1)
N14	Ⓢ	XWA3B	ϕ3	(2)
N15		XTB3 + 8BFYR	Tapping, ⊕3×8	(1)
ACCESSORIES				
A1		SJP2129 – 5	Connection Cord, Pin-Pin	(1)
A2		SSA901	Loop Antenna, FM	(1)
A5		SQF12120	Instruction Book	(1)
A6		SSA605 – 1	Loop Antenna	(1)
A7		SMA231	Holder, Loop Antenna	(1)
A8		SMA233 – 1	Holder, Loop Antenna	(1)
PACKING PARTS				
P1	○	SPG4909	Carton Box	(1)
P1	Ⓚ	SPG4907	Carton Box	(1)
P2		SPS3493	Pad, Front	(1)
P3		SPS3495	Pad, Rear	(1)
P4	○	SPP697	Polyethylene Sheet	(1)
P4	Ⓚ	SPP647	Polyethylene Sheet	(1)

■ EXPLODED VIEW



A	⑪ ⑫ ⑮ ⑭ ㉒ ㉑ ⑯
B	⑥ ② ⑬ ③ ⑦ ⑱ ㉔ ⑰ ⑲ ㉕
C	① ④ ⑤ ⑧ ⑨ ⑩ ⑳-1 ⑳-1 ⑳ ㉓ ⑳-1

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